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Vol. 946 Number 3

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OFFICIAL GAZETTE of the
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May 18, 1976 Volume 946 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

February and March 1976 Classification Order

The reclassifications covered by the following classification changes became effective during February and March, 1976.

Classification Order 500, effective Feb. 3, 1976:	Class	Subclasses
Abolished	5	348.
Established	5	365–371.
Position change(s)	5	349; 350; 347.
Title change(s)	None	

Classification Order 501, effective Feb. 4, 1976:	Class	Subclasses
Abolished	2	224–226.
Established	2	400–409.
Position change(s)	None	
Title change(s)	None	

Classification Order 502, effective Feb. 6, 1976:	Class	Subclasses
Abolished	26	54–68.
Established	26	71–106.
Position change(s)	None	
Title change(s)	None	

Classification Order 503, effective Feb. 9, 1976:	Class	Subclasses
Abolished	36	2.5; 4.5.
Established	36	83–139.
Position change(s)	None	
Title change(s)	None	

Classification Order 504, effective Feb. 17, 1976:	Class	Subclasses
Abolished	139	12; 122–132; 196 and 370.
Established	139	196.1–196.4; 370.1; 370.2; 429–454.
Position change(s)	139	13R–16.
Title change(s)	139	13R.

Classification Order 505, effective Feb. 17, 1976:	Class	Subclasses
Abolished	211	148; 176–179.
Established	211	186–209.
Position change(s)	211	175.
Title change(s)	None	

Classification Order 506, effective Feb. 20, 1976:	Class	Subclasses
Abolished	248	38–48.
Established	47	40.5.
	248	511–541.
Position change(s)	None	
Title change(s)	248	117.1.

Classification Order 507, effective Feb. 23, 1976:	Class	Subclasses
Abolished	280	11.13; 11.35; 34; 36; 42; 96.2; 104.5; 124; 150; 150.5.
Established	280	600–770.
Position change(s)	None	
Title change(s)	None	

Classification Order 508, effective Feb. 23, 1976:	Class	Subclasses
Abolished	180	Unnumbered subclass which follows subclass 79; 79.2.
Established	180	131–163.
Position change(s)	None	
Title change(s)	180	79.1.

Classification Order 509, effective Feb. 26, 1976:	Class	Subclasses
Abolished	None	
Established	222	590–607.
Position change(s)	None	
Title change(s)	None	

Classification Order 510, effective Feb. 26, 1976:	Class	Subclasses
Abolished	244	77.
Established	244	175–197.
Position change(s)	None	
Title change(s)	None	

Classification Order 511, effective March 3, 1976:	Class	Subclasses
Abolished	272	57–60; 79–84.
Established	272	93–146.
Position change(s)	None	
Title change(s)	None	

Classification Order 512, effective March 4, 1976:	Class	Subclasses
Abolished	46	243–245 and 247.
Established	46	248–269.
Position change(s)	None	
Title change(s)	None	

Classification Order 513, effective March 9, 1976:	Class	Subclasses
Abolished	124	11–15 and 30.
Established	124	54–92.
Position change(s)	124	1.
Title change(s)	None	

Classification Order 514, effective March 9, 1976:	Class	Subclasses
Abolished	252	301.2; 301.3.
Established	252	301.16–301.19; 301.21–301.29; 301.31–301.36.
Position change(s)	252	301.4R–301.6F.
Title change(s)	252	301.4R.

Classification Order 515, effective March 11, 1976:	Class	Subclasses
Abolished	266	1–43 (All).
	432	254–257.
Established	266	44–267; Cross Reference "Art" Collections, 900–905.
	432	254.1; 254.2.
Position change(s)	None	
Title change(s)	None	

Classification Order 516, effective March 16, 1976:	Class	Subclasses
Abolished	215	7–9.
Established	215	365–367.
Position change(s)	None	
Title change(s)	None	

ALFRED C. MARMOR
Administrator for Documentation
April 9, 1976

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,831,952, E. L. Warner, COOKING APPARATUS; **3,081,392,** same, HIGH-FREQUENCY OVEN, **filed** Mar. 21, 1972, D.C. Ohio (Cleveland) Doc. C72–275, *The Tappan Company* v. *Norris Industries and Pekoc Hardware Co.* Stipulation and order dismissing case without prejudice, Aug. 13, 1975.

2,947,075, E. F. Apple, LUMINESCENT ZINC SULFIDE PHOSPHORS AND THE PREPARATION THEREOF, **filed** Oct. 28, 1975, D.C., W.D. Pa. (Pittsburgh), Doc. C.A. 75–1379, *Concast Incorporated* v. *Rokop Engineering Corp.*

3,021,789, C. E. Ryden, MOTOR SPEED CONTROL ARRANGEMENT, **filed** Dec. 30, 1975, D.C. Oreg. (Portland) Doc. C–75–1179, *Jackson-Rand Corporation* v. *Osgood Controls, Inc., Xercon, Inc. and George M. Osgood.*

3,056,836, H. D. Moed, ARALKYLAMINES AND METHODS OF PREPARATION THEREOF, **filed** June 12, 1975, D.C. Conn. (Bridgeport) Doc. B–75–184, *Mead Johnson & Company and U.S. Philips Corporation* v. *Danbury Pharmacal, Inc.* Consent judgment that injunction be issued permanently enjoining defendant from use of said patent, entered Dec. 5, 1975.

3,081,392. (See 2,831,952.)

3,164,761, M. K. Richmond, LOAD-RESPONSIVE, AUTOMATIC-STOP DRIVE MECHANISM, **filed** Jan. 16, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV 76–201–DWW, *Moscow K. Richmond, doing business as Doorking Manufacturing Co.* v. *Scovill Manufacturing Company, doing business as Nutone Housing Products.*

3,169,776, M. D. Felt, MULTIPLE PURPOSE SELF-LOADING MACHINERY PACKING; **3,342,500,** C. B. Knudson, PACKING CONSTRUCTION, **filed** Nov. 5, 1975, D.C., C.D. Utah (Salt Lake City) Doc. C–75–442, *Parker-Hannifin Corporation* v. *Poly Seal, Inc. et al.*

3,180,744, Davies and Walther, REFRACTORY, **filed** Feb. 14, 1973, D.C., N.D. Ohio (Cleveland) Doc. C73–168, *Dresser Industries, Inc.* v. *Elira Corporation.* Stipulation and order dismissing complaint and counterclaims with prejudice, Jan. 26, 1976.

3,182,164, R. Ironfield, ELECTROMAGNETIC ENERGY SEAL, **filed** Oct. 12, 1973, D.C., N.D. Ill. (Chicago) Doc. 73c2631, *Matushita Electric Industrial Co., Ltd. and Matushita Electric Corporation of America* v. *Raytheon Company.* Cause dismissed by order of stipulation, July 30, 1975.

3,228,620, K. P. Lee, YARDAGE COMBINE, **filed** Jan. 20, 1976, D.C., C.D. Calif. (Los Angeles) Doc. 76–228–FW, *Chromalloy American Corporation* v. *B. Wallace Fischmann.*

3,298,322, E. L. Sherrod, PUMP FOR SEMI-FLUID MATERIALS; **3,380,388,** same, AUTOMATIC CONTROL SYSTEM FOR CONCRETE PUMP; **3,465,685,** same, SELF-CLEARING ROTATING CONVEYOR, **filed** Dec. 19, 1975, D.C., E.D. Pa. (Philadelphia) Doc. C.A. 75–3650, *Eugene L. Sherrod and Frances L. Sherrod* v. *Allentown Pneumatic Gun Company.*

3,309,803, E.M.S. Wilson, EMBROIDERY HOLDERS SUCH AS LAP AND FLOOR HOLDERS WITH CLAMPS THEREFOR, **filed** Aug. 6, 1975, D.C., S.D.N.Y., Doc. 3844, *Erica M. S. Wilson* v. *Kayanee Corportaion of America.*

3,315,454, W. L. Carranza, SYNTHETIC BALING AND TYING TWINES, **filed** Feb. 27, 1975, D.C., M.D.N.C. (Greensboro) Doc. C–75–71–WS, *William L. Carranza* v. *Wellington Synthetic Fibers, Inc.*

3,324,954, W. J. Westendorf, LOADER DEVICE AND METHOD OF MOUNTING SAME ON TRACTOR, **filed** May 21, 1975, D.C., N.D. Iowa (Sioux City) Doc. C–75–4028, *International Harvester Co.* v. *Walter J. Westendorf.*

3,342,500. (See 3,169,776.)

3,352,520, BUMGARNER, Knutson and Royal, BAG HOLDER, **filed** Sept. 9, 1975, D.C., S.D.N.Y., Doc. 75–1864–C–WM, *Homeline Corporation* v. *Mobil Oil Corp. and Mobil Chemical Corp.*

3,364,806, J. W. Chaivre, CAPPED WHEEL NUT, **filed** Oct. 9, 1975, D.C., E.D. Mich. (Detroit) Doc. 75–71974, *Towne Robinson Fastener Company* v. *Buell Industries Inc.*

3,380,388. (See 3,298,322.)

3,380,927, Edelstein and Welles, BROAD SPECTRUM SURFACE ACTIVE AGENT AND METHOD OF MAKING THE SAME, **filed** Dec. 11, 1974, D.C., M.D. Ga. (Macon) Doc. C–74–205–MAC, *Dexter Chemical Corporation* v. *Star Chemicals, Inc.*

3,465,685. (See 3,298,322.)

3,537,114, F. J. Mis, BED FRAME ASSEMBLY, **filed** Nov. 7, 1974, D.C., N.D. Ill. (Chicago) Doc. 74c3200, *Harris-Hub Company, Inc.* v. *Interlake, Inc.* Stipulation, case hereby dismissed without prejudice, June 3, 1975. **Same, filed** May 9, 1975, D.C., C.D. Calif. (Los Angeles) Doc. 75–1601, *Harris-Hub Company, Inc.* v. *Interlake, Inc.* Judgment by consent and order thereon that plaintiff is owner of said patent, that defendant's counterclaim is dismissed and defendant is released from all liability for past infringement by virtue of settlement, entered Jan. 9, 1976.

3,538,848, W. P. Barbour, LATCH MEANS FOR A TRAVELING ROLLER PLATEN ON A SWINGABLE CARRIAGE, **filed** Jan. 29, 1976, D.C., M.D. Fla. (Tampa) Doc. 76–67–C–T–K, *Control Data Corporation* v. *National Business Systems, Inc. of New York and National Business Systems, Inc. of Canada.*

3,552,469, L. M. Corless, TIRE BEAD SEATER; **3,675,705,** same, TIRE BEAD SEATING AND INFLATION APPARATUS; **3,805,871,** same, TIRE MOUNTING, BEAD SEATING AND INFLATION APPARATUS AND METHOD OF USE, **filed** Sept. 22, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c3150, *B & J Manufacturing Co.* v. *Robert A. Hill, etc.*

3,553,737, J. Bauman, METHOD OF APPLYING HAIR, **filed** Oct. 16, 1975, D.C., N.D. Calif. (San Francisco) Doc. C–75–2180–RFP, *Dura-Hair International, Inc. and Look International (Surgical Implants), Inc.* v. *Konstatine Giotis and Christine Giotis, individually and doing business as Dermatex Men's Hair, also known as Dermatex Custom Hair for Men.*

3,671,917, Ammon and Inacker, PRINTED CIRCUIT BOARD CONNECTOR, **filed** Dec. 19, 1973, D.C., N.D. Tex. (Dallas) Doc. CA–3–7989–E, *Elfab Corporation* v. *International Telephone and Telegraph Corporation.* **Same, filed** Dec. 19, 1973, D.C., S.D. Tex. (Houston) Doc. CA–73–H–1722, *Elfab Corporation* v. *International Telephone & Telegraph Corp.*

3,671,917, J. P. Ammon, PRINTED CIRCUIT BOARD CONNECTOR; **3,676,926,** J. A. Kendall, METHOD FOR MANUFACTURING CONNECTOR TERMINALS; **3,769,679,** same, APPARATUS FOR MANUFACTURING CONNECTOR TERMINALS, **filed** Aug. 4, 1975, D.C., C.D. Calif. (Los Angeles) Aug. 4, 1975, D.C., C.D. Calif. (Los Angeles) Doc. CV 75–2610–MML, *Elfab Corporation* v. *NCR Corporation and Elco Corporation.*

3,675,705. (See 3,552,469.)

3,676,926. (See 3,671,917.)

3,769,679. (See 3,671,917.)

3,805,871. (See 3,552,469.)

3,844,158, F. W. Mercer, MOBILE MUFFLER SHOP, **filed** Mar. 3, 1975, D.C., C.D. Calif. (Los Angeles) Doc. CV–75–779–R, *American Machine & Hydraulics, Inc.* v. *Floyd W. Mercer, doing business as Wholesale Brake Supply.* Filed order granting plaintiff's motion for summary judgment and permanently enjoining defendants from further use, etc. of plaintiff's patent, entered Sept. 8, 1975.

D. 222,198, M. H. Boldt, HAIR DRYER, **filed** Apr. 25, 1972, D.C., N.D. Ohio (Cleveland) Doc. C72–397, *National Presto Industries, Inc.* v. *Union Savings Assn.* Order dismissing action without prejudice to the right, upon good case shown within 60 days, to re-open the action if settlement is not consummated, Jan. 22, 1976.

PATENT NOTICES

Certificates of Correction for the Week of May 18, 1976

Re. 28,061	3,910,243	3,929,183	3,937,809
Re. 28,305	3,911,041	3,929,303	3,937,836
Re. 28,701	3,911,483	3,929,328	3,937,976
3,581,542	3,912,525	3,929,455	3,938,022
3,582,553	3,913,033	3,929,476	3,938,064
3,595,477	3,913,588	3,929,526	3,938,181
3,707,492	3,914,167	3,929,586	3,938,241
3,711,287	3,914,470	3,929,757	3,938,595
3,723,797	3,915,562	3,929,958	3,938,852
3,732,134	3,915,574	3,930,125	3,939,087
3,736,650	3,916,048	3,930,130	3,939,145
3,762,002	3,916,054	3,930,632	3,939,268
3,770,422	3,917,170	3,930,926	3,939,293
3,787,712	3,917,413	3,931,105	3,940,337
3,796,156	3,917,951	3,931,868	3,940,430
3,797,173	3,918,884	3,932,222	3,940,447
3,798,154	3,919,096	3,932,444	3,940,448
3,816,824	3,919,212	3,932,796	3,940,548
3,825,390	3,919,213	3,933,038	3,940,745
3,827,260	3,919,666	3,933,091	3,940,834
3,841,871	3,919,692	3,933,206	3,941,057
3,844,871	3,920,056	3,933,518	3,941,312
3,850,225	3,920,578	3,933,669	3,941,484
3,861,227	3,920,631	3,933,695	3,941,575
3,865,387	3,920,835	3,933,836	3,942,069
3,865,672	3,920,871	3,933,910	3,942,189
3,865,800	3,920,978	3,933,932	3,942,316
3,865,846	3,921,202	3,934,026	3,942,379
3,868,393	3,922,996	3,934,352	3,942,429
3,869,316	3,923,125	3,934,408	3,942,469
3,872,080	3,923,232	3,934,452	3,942,644
3,872,863	3,923,700	3,934,749	3,942,721
3,874,160	3,923,896	3,935,013	3,942,859
3,879,582	3,923,928	3,935,059	3,942,959
3,879,926	3,923,954	3,935,131	3,943,225
3,882,160	3,924,975	3,935,183	3,943,284
3,882,682	3,925,283	3,935,228	3,943,431
3,883,727	3,925,451	3,935,311	3,943,488
3,884,867	3,925,595	3,935,477	3,943,507
3,887,374	3,925,981	3,935,494	3,943,538
3,889,018	3,926,170	3,935,824	3,943,655
3,889,841	3,926,493	3,935,848	3,943,808
3,891,767	3,926,932	3,935,912	3,943,835
3,893,266	3,926,967	3,935,965	3,944,058
3,894,305	3,927,025	3,936,114	3,944,113
3,895,027	3,927,093	3,936,177	3,944,202
3,901,043	3,927,106	3,936,239	3,944,571
3,901,443	3,927,139	3,936,247	3,944,633
3,901,901	3,927,381	3,936,330	3,944,781
3,903,672	3,928,031	3,936,418	3,944,935
3,904,601	3,928,056	3,936,452	3,945,010
3,904,644	3,928,348	3,936,504	3,945,220
3,905,152	3,928,428	3,936,528	3,946,010
3,907,590	3,928,602	3,936,585	3,946,111
3,907,867	3,928,652	3,937,000	3,946,430
3,907,915	3,928,703	3,937,166	
3,908,704	3,928,774	3,937,486	
3,909,439	3,929,091	3,937,679	

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,845,373, M. Gordon and J. J. Lafferty, 2-POLYMETHYLALLYL - 5,9 - DIMETHYL - 6,7 - BENZMORPHANS AND DERIVATIVES, Interference No. 96,569, decided June 20, 1974, claims 1, 2, 3, 4 and 5.

Patent No. 3,420,615, W. S. Griffith, METHOD FOR FIXING PHTHALOCYANINE DYESTUFFS ON TEXTILE FIBERS, Interference No. 96,888, decided Feb. 5, 1976, claims 1, 2, 3 and 5.

Patent No. 3,554,465, Y. Marukawa, TAPE DRIVE UNIT FOR TAPE RECORDER, Interference No. 98,087, decided Oct. 23, 1975, claims 1 and 9.

Patent No. 3,574,129, M. J. Hammond, R. F. Herner and F. F. Mikus, METHOD FOR PREVENTING HYDROLYSIS OF A RARE EARTH OXIDE HOST PHOSPHOR IN A COATING SLURRY, Interference No. 98,522, decided Dec. 10, 1975, claims 1, 2 and 3.

Patent No. 3,641,112, Y. Ichikawa and Y. Yamanaka, PROCESS FOR THE PREPARATION OF BIS-(β-HYDROXYALKYL) ESTERS OF AROMATIC DICARBOXYLIC ACIDS, Interference No. 98,557, decided Jan. 12, 1976, claim 1.

Patent No. 3,647,751, G. Darsow, POLYARYLETHER-SULPHONES, Interference No. 98,974, decided Jan. 8, 1976, claim 1.

Patent No. 3,749,859, R. C. Webb, J. R. Webb and T. N. Tyler, KEYBOARD SWITCH ASSEMBLY WITH IMPROVED HERMETICALLY SEALED DIAPHRAGM CONTACT STRUCTURE, Interference No. 98,937, decided Dec. 30, 1975, claims 4 and 11.

Patent No. 3,749,859, R. C. Webb, J. R. Webb and T. N. Tyler, KEYBOARD SWITCH ASSEMBLY WITH IMPROVED HERMETICALLY SEALED DIAPHRAGM CONTACT STRUCTURE, Interference No. 98,938, decided Dec. 30, 1975, claim 9.

Patent No. 3,766,445, J. L. Reuter and J. S. Sandhu, SEMICONDUCTOR SUBSTRATE WITH A PLANAR METAL PATTERN AND ANODIZED INSULATING LAYERS, Interference No. 99,088, decided Jan. 19, 1976, claim 1.

Patent No. 3,876,001, W. B. Goode, KICKOVER TOOL, Interference No. 99,091, decided Jan. 12, 1976, claim 11.

Patents Available for Licensing or Sale

3,365,311. METHOD OF PROCESSING PACKAGED FOOD PRODUCTS. John Schmidt, Packing House Consultant, 322 Greenwood Ave., Jenkintown, Pa., 19046.

3,512,301. TOY & RECLINING BABY BOTTLE HOLDER. Joseph Kramer, Route #2, Box 193, Woodruff, S.C., 29388.

3,837,613. CONCRETE FORM RELEASE FLANGE. John Sontag, 7438 18th Ave., Burnaby, British Columbia, Canada v3n 1h7.

3,911,752. REMOTE CONTROL APPARATUS FOR TELEVISION RECEIVERS. Joyce L. Olsen, Arlington, Va., and Stephen A. Lazorcak, Jr., Arlington, Va. Correspondence to: Stephen A. Lazorcak, P.O. Box 33,082, District Heights, Md., 20028.

3,915,323. VERSATILE BOAT LOADER APPARATUS USED ON RECREATIONAL VEHICLES. Oscar E. Underhill, 1009 Barrow St., Anchorage, Alaska, 99501.

3,916,502. METHOD OF ESTABLISHING A PIPE JOINT. Luigi Bagnulo, Via A. Volta, 18, Milan, Italy. Correspondence to: Michael J. Striker, 360 Lexington, Ave., New York, N.Y., 10017.

3,920,317. BIASING RING FOR SPECTACLES. Hermann-Eckardt Kell, P.O. Box 244, Sault Ste. Marie, Ontario, Canada. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,926,086. PORTABLE SAW MILL RUNS WITH CHAIN SAW. Paul R. Crane, Tucker Hill Road, Box 60A, Houghton, N.Y., 14744.

3,927,720. LAWN PLUGGER. Erwin Rauch, 1431 Monticello Lane, Rockford, Ill., 61107.

3,933,014. DOOR LOCK ATTACHMENT. Adolph Moses, 8 East 83rd St., New York, N.Y., 10028.

3,937,224. COLOSTOMY CATHETER. Ronald L. Uecker, 915 Grant St., Wausau, Wis., 54401.

3,943,313. AUTOMOTIVE DOOR ACCESSORY FOR TURNING OFF VEHICLE HEADLIGHT SWITCH. Aldo J. Carboni, 4642 W. El Segundo Blvd., Hawthorne, Calif., 90250.

3,945,144. TROTLINE FISHHOOK HOLDER AND DISPENSER. Audie C. Purselley, 1507 E. Main St., Mesa, Ariz., 85203.

Hazeltine Research, Inc. offers to grant non-exclusive licenses on reasonable terms and conditions under the following patent listed below.

Inquiries and requests for licenses should be addressed to: Hazeltine Research, Inc., 5445 W. Diversey Ave., Chicago, Ill., 60639. Attention: Mr. S. P. Ronzheimer.

3,542,536. METHOD OF FORMING OPTICAL WAVEGUIDE BY IRRADIATION OF DIELECTRIC MATERIAL.

General Electric Company is prepared to grant non-exclusive licenses under the following patents on reasonable terms to domestic manufacturers.

Application for licenses under the following 2 patents may be addressed to: Division Patent Counsel, Switchgear & Distribution Transformer Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,898,367. PARTICLE TRAP FOR COMPRESSED-GAS INSULATED HIGH VOLTAGE BUS.

3,920,885. HIGH-VOLTAGE, COMPRESSED-GAS INSULATED BUS.

Application for licenses under the following 12 patents may be addressed to: Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky., 40225.

3,192,642. AUTOMATIC FABRIC DRYING MACHINE AND CONTROL MEANS.

3,324,984. CENTRIFUGALLY RELEASED CLUTCH WITH TRIGGER RELEASED AUXILIARY WEIGHTS.

3,359,760. CONTROL FOR AUTOMATIC WASHER.

3,575,057. DRIVE MECHANISM.

3,585,747. DISPLAY MEMBER.

3,788,243. DOMESTIC SOLID WASTE INCINERATOR.

3,788,347. SINGLE HOSE COUPLING SYSTEM.

3,895,216. LOW THERMAL MASS SOLID PLATE SURFACE HEATING UNIT.

3,922,892. SUSPENSION SYSTEM FOR A WASHING MACHINE.

3,927,853. HOUSEHOLD APPLIANCE LEVELING SYSTEM.

3,934,728. DISHWASHER RACK.

3,937,042. REUSABLE WATER SOFTENER SYSTEM.

Application for licenses under the following 19 patents may be addressed to: Patent Counsel, Motors and Drives Business Division, General Electric Company, 1285 Boston Ave., Building 21 EE., Bridgeport, Conn., 06602.

3,141,057. NON-CONTACTING MEASURING APPARATUS.

3,764,375. POLYURETHANE WIRE COATING METHOD.

3,800,067. METHOD OF MANUFACTURING AN ELECTRICALLY INSULATED METALLIC CONDUCTOR WITH THE INSULATION ADHERING TO THE CONDUCTOR, AND PRODUCT.

3,816,639. HIGH VOLTAGE CABLE SPLICE WITH GRADED INSULATION AND METHOD OF MAKING SAME.

3,833,525. PHENOLIC BLOCKED ISOCYANATE COMPOSITIONS CONTAINING A HETEROCYCLIC NITROGEN CATALYST.

3,845,166. CURABLE COMPOSITION COMPRISING POLYVINYL CHLORIDE, CHLORINATED POLYOLEFIN AND AN ETHYLENE POLYMER AND THE CURED PRODUCT THEREOF.

3,862,353. HIGH TEMPERATURE ASBESTOS INSULATED ELECTRICAL CONDUCTOR, AND METHOD OF MAKING SAME.

3,878,319. CORONA - RESISTANT ETHYLENE-PROPYLENE RUBBER INSULATED POWER CABLE.

3,900,681. INSULATED ELECTRICAL CONDUCTOR.

3,908,067. FLAME RESISTANT POLYOLEFIN, METHOD OF PRODUCING SAME, AND INSULATED PRODUCT.

3,908,068. FIRE RETARDING SYSTEM FOR POLYMERIC COMPOSITIONS, AND A METHOD AND PRODUCTS COMPRISING THE SAME.

3,909,486. METHOD OF HALOGENATING THERMOPLASTIC POLYOLEFINS.

3,909,507. ELECTRICAL CONDUCTORS WITH STRIPPABLE POLYMERIC MATERIALS.

3,923,731. PRESSURELESS CURING OF FILLED ETHYLENE CONTAINING POLYMERIC COMPOSITIONS.

3,924,036. METHOD OF CONTINUOUS CASTING.

3,924,985. APPARATUS FOR MAINTAINING A PRESPURIZED LIQUID-GAS INTERFACE WITHIN A CONDUIT.

3,930,104. FLAME-RESISTANT POLYOLEFIN USED AS INSULATION FOR ELECTRICAL CONDUCTORS.

3,935,042. METHOD OF MANUFACTURING CORONA-RESISTANT ETHYLENE-PROPYLENE RUBBER INSULATED POWER CABLE, AND THE PRODUCT THEREOF.

3,936,572. ELECTRICAL CABLE INSULATED WITH A CORONA RESISTANT POLYETHYLENE COMPOSITION CONTAINING A SILICON ADDITIVE.

Application for licenses under the following 6 patents may be addressed to: General Electric Company, Division Patent Counsel, Housewares and Audio Business Division, 1285 Boston, Ave., Bridgeport, Conn., 06602.

3,936,515. SLINGER MEANS FOR HUMIDIFIER.

3,036,368. END TERMINAL FOR SHEATHED TUBULAR HEATER AND METHOD OF MANUFACTURE.

3,045,370. STEAM IRON WITH POSITION CONTROLLED VALVE.

3,067,397. END TERMINAL FOR SHEATHED TUBULAR HEATER.

3,605,299. ADJUSTABLE SPRAYER IRON.

3,780,457. STEAM IRON.

Application for licenses under the following 2 patents may be addressed to: Patent Counsel, Gas Turbine Products Division, General Electric Company, 1 River Road, Building No. 500, 2nd Floor, Schenectady, N.Y., 12345.

3,895,686. ACOUSTIC ATTENUATOR PROVIDING RELATIVELY HIGH INSERTION LOSS AT LOW FREQUENCIES.

3,917,432. BORESCOPE SUPPORT APPARATUS.

Application for licenses under the following 5 patents may be addressed to: General Electric Company, Transportation Systems Business Division, 2901 East Lake Road, Erie, Pa., 16531.

3,447,603. MEANS FOR RESILIENTLY MOUNTING TUBULAR MEMBERS.

3,739,840. HEAT EXCHANGER HAVING RESILIENTLY MOUNTED TUBULAR MEMBERS.

3,582,756. POLYPHASE POWER CONVERTER CIRCUITS HAVING A HIGH FREQUENCY TRANSFORMER LINK.

3,882,369. CONTROL OF CYCLOCONVERTER SYSTEMS HAVING A PARALLEL RESONANT COMMUTATION CIRCUIT.

3,882,370. CONTROL OF POWER CONVERTERS HAVING A PARALLEL RESONANT COMMUTATION CIRCUIT.

Application for licenses may be addressed to the General Electric Company, Appliance Components Business Division, 1635 Broadway, Fort Wayne, Ind., 46804, Attn: Patent Counsel.

3,479,218. METHOD OF TREATING INSULATED WIRE.

3,920,376. CONTROL SYSTEM FOR A FUEL BURNER.

3,921,402. THERMAL ACTUATOR.

3,931,483. MULTIPLE CIRCUIT CONTROL SWITCH HAVING ARTICULATED CASCADED OPERATING MECHANISM.

Application for licenses under the following patents may be addressed to: General Electric Company, Space Division, P.O. Box 8555, Philadelphia, Pa., 19101.

3,916,804. FIRE RESISTANT STRUCTURE.

3,926,150. VAPOR GENERATOR CARBURETION SYSTEM.

3,929,166. PIPELINE THERMAL INSULATION.

3,938,129. POWER LINE DATA TRANSMISSION SYSTEM.

Application for licenses under the following 32 patents may be addressed to: Division Patent Counsel, Lamp Business Division, General Electric Company, Nela Park, Cleveland, Ohio, 44112.

2,945,327. METHOD OF MANUFACTURING ELECTRIC LAMPS OR SIMILAR DEVICES.

3,946,911. COATED ELECTRIC LAMP.

2,951,735. METHOD OF MAKING ELECTRIC LAMPS.

2,957,276. BASE MAKING MACHINE.

2,960,949. SHELL PRESS.

2,961,285. FLASHING MACHINE FOR ELECTRIC LAMPS.

2,961,568. FILAMENT JOINT FOR INCANDESCENT LAMPS.

2,967,113. COATING METHOD.

2,980,266. APPARATUS FOR LOADING LAMP MOUNTS.

2,984,266. LAMP FILAMENT MOUNTING APPARATUS.

2,984,385. APPARATUS FOR LOADING LAMP PARTS.

2,987,643. FILAMENT JOINT FOR ELECTRIC LAMPS OR SIMILAR DEVICES.

2,987,696. LAMP BASE WITH COLLARED INSULATOR.

3,000,407. ELECTRIC LAMP MOUNT MAKING METHOD AND APPARATUS.

3,007,069. HEAT DEFLECTORS FOR ELECTRIC LAMPS OR SIMILAR DEVICES.

3,033,242. ELECTRIC LAMP MOUNT MAKING APPARATUS.

3,046,633. LAMP BASE AND BULB ASSEMBLY APPARATUS.

3,073,356. ELECTRIC LAMP MOUNT MAKING METHOD.

3,429,832. GLOWER LAMP AND PROCESS.

3,509,411. STRANDED TUNGSTEN WIRE INCANDESCENT LAMP FILAMENT.

3,564,681. METHOD OF MANUFACTURING ELECTRIC INCANDESCENT LAMP AND MOUNT STRUCTURE THEREFOR.

3,569,907. LAMP BASE AND SOCKET.

3,571,899. MANUFACTURE OF METAL FOIL LEADS.

3,573,534. LAMP BASE AND LEADING-IN WIRE CONNECTION.

3,850,856. GETTER COMPOSITION FOR ELECTRIC LAMPS AND SIMILAR DEVICES.

3,594,884. METHOD OF MANUFACTURING AN ELECTRICAL DEVICE.

3,646,387. ELECTRIC INCANDESCENT LAMP WITH TAPERED SEALING COLLAR.

3,679,285. GETTERING PROCESSES FOR ELECTRIC LAMPS AND SIMILAR DEVICES.

3,769,503. LAMP FIXTURES HAVING DICHROIC FILTER ARRANGEMENT FOR SELECTIVELY DIRECTING HEAT AND LIGHT.

3,852,631. INCANDESCENT LAMP AND BASE.

3,875,628. METHOD OF ASSEMBLING A LAMP AND BASE.

3,909,649. ELECTRIC LAMP WITH LIGHT-DIFFUSING COATING.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below.

Inquiries respecting licenses under these patents should be addressed to: RCA Corp., Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y., 10036.

3,936,115. START-UP CIRCUIT FOR A DEFLECTION SYSTEM.

3,936,597. VIDEO FREQUENCY AMPLIFIER OPERABLE IN EITHER OF TWO BIAS CONDITIONS.

3,936,731. AMPLIFIER WITH FAST RECOVERY AFTER INPUT SIGNAL OVERSWING.

3,936,755. PROXIMITY SWITCH CIRCUIT.

3,936,838. MULTIMODE COUPLING SYSTEM INCLUDING A FUNNEL-SHAPED MULTIMODE COUPLER.

3,936,859. SEMICONDUCTOR DEVICE INCLUDING A CONDUCTOR SURROUNDED BY AN INSULATOR.

3,936,863. INTEGRATED POWER TRANSISTOR WITH BALLASTING RESISTANCE AND BREAKDOWN PROTECTION.

3,936,868. TELEVISION STUDIO CONTROL APPARATUS.

3,936,930. METHOD OF MAKING ELECTRICAL CONNECTIONS FOR LIQUID CRYSTAL CELLS.

3,937,987. THRESHOLD DETECTOR.

3,938,004. DEFLECTION SYSTEM.

3,938,045. TRANSMITTER FOR FREQUENCY SHIFT KEYED MODULATION.

3,938,054. TRANSISTOR AMPLIFIER.

3,938,172. SEMICONDUCTOR INJECTION LASER.

3,938,179. COMB FILTER FOR VIDEO PROCESSING.

3,938,181. AUTOMATIC LUMINANCE CHANNEL FREQUENCY RESPONSE CONTROL APPARATUS.

3,938,242. FABRICATION OF LIQUID CRYSTAL DEVICES.

3,938,810. CENTER HOLE FORMATION IN AN INFORMATION STORING DISC.

3,939,098. SUSPENSION FOR DEPOSITING A PYROELECTRIC MATERIAL.

3,939,380. CLASS D AMPLIFIER.

3,939,447. SPRING MOUNT FOR A CATHODE RAY TUBE YOKE.

3,940,096. RE-ORIENTATION OF A SPACECRAFT RELATIVE TO ITS ANGULAR MOMENTUM VECTOR.

3,940,148. LID INTERLOCK APPARATUS FOR DISC RECORD PLAYER.

3,940,205. ELECTROCHROMIC DEVICE HAVING AN INDIUM ELECTRODE.

3,940,507. ELECTRON BEAM RECORDING MEDIA AND METHOD OF RECORDING.

3,940,511. METHOD FOR PREPARING HAZE-RESISTANT LITHIUM - SILICATE GLARE - REDUCING COATING.

3,940,556. TIMING ERROR DETECTING AND SPEED CONTROL SYSTEM.

3,940,661. DEFLECTION SYSTEM WITH OVERSCAN PROTECTION.

3,940,695. DOPPLER CORRECTION OF TRANSMISSION FREQUENCIES.

3,940,769. BINAURAL AUDITORY PRESENTATION APPARATUS.

3,940,772. CIRCULARLY POLARIZED, BROADSIDE FIRING TETRAHELICAL ANTENNA.

General Motors Corporation is prepared to grant non-exclusive licenses under the following 6 patents upon reasonable terms.

Application for license may be addressed to the Director, Patent Section, General Motors Building, 3044 West Grand Blvd., Detroit, Mich., 48202.

3,709,632. BLADE TIP CLOSURE.

3,710,690. ACCELERATOR.

3,717,443. ZIRCONIUM DIFFUSION BARRIER IN TITANIUM SILICON CARBIDE COMPOSITE MATERIALS.

3,718,258. CONTAMINANT SEPARATION.

3,724,207. COMBUSTION APPARATUS.

3,732,031. COOLED AIRFOIL.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 24, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds: Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-15-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	7-7-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Fore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-14-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products: Laminating Methods and Apparatus: Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions: Bleaching; Dyeing and Photography.	6-3-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-21-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures: Illumination: Horology; Acoustics; Recorders; Weighing Scales.	3-10-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-23-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-22-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-24-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-16-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	1-10-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-19-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	10-1-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-13-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-15-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-2-75

Expiration of patents: The patents within the range of numbers indicated below expire during May 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,894,634 to 2,588,678 inclusive
Plant Patents..... Numbers 1,829 to 1,837 inclusive

REISSUES

MAY 18, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

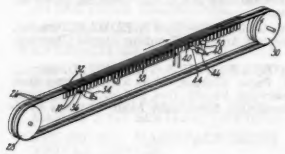
Re. 28,812
METHOD OF MAKING SELF-LOCKING THREADED ELEMENTS

Richard J. Duffy, Salem, Mass., assignor to USM Corporation, Boston, Mass.

Original No. 3,579,684, dated May 25, 1971, Ser. No. 778,636, Nov. 25, 1968. Division of Ser. No. 628,683, April 5, 1967, Pat. No. 3,498,352, which is a continuation-in-part of Ser. No. 599,042, Dec. 5, 1966, abandoned. Application for reissue July 10, 1972, Ser. No. 270,540

Int. Cl.[2] B23G *9/00;* **B21K** *1/44, 1/56, 1/64*

U.S. Cl. 10—10 P **9 Claims**



1. The method of providing a threaded portion of an article with a self-locking element comprising an adhered body of normally hard, tough, resilient thermoplastic resin, said method including the steps of heating the threaded portion to a temperature above the softening point of said resin, thereafter directing a stream of fine particles of said thermoplastic resin to a selected area of said threaded portion while said threaded portion is at a temperature above said softening point, catching resin particles from said stream by softening them and causing them to adhere to said threaded portion by heat from the surface of said threaded portion progressively to build up a deposit of resin on said selected area, the radial thickness of said deposit being greatest substantially midway between longitudinal edges of said deposit and diminishing in thickness towards those edges, fusing adhered particles to a substantially continuous body of resin, and cooling said body of resin to harden it to a solid body resistant to displacement and effective to give a locking action when a complementary threaded member is assembled with said threaded portion.

Re. 28,813
PACKING MACHINE

Robert William Davies; Maxwell Francis Veness, and Leonard Thornton, all of London, England, assignors to Molins Limited, London, England

Original No. 3,762,130, dated Oct. 2, 1973, Ser. No. 102,013, Dec. 28, 1970. Application for reissue July 3, 1974, Ser. No. 485,671

Claims priority, application United Kingdom, Jan. 9, 1970, 1193/70

Int. Cl.[2] B65B *5/02, 19/12, 19/28*

U.S. Cl. 53—53 **13 Claims**

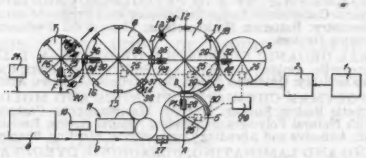
1. A packing machine comprising

a. a first rotatably mounted drum having a plurality of pockets in the periphery thereof, each for receiving a carton blank and subsequently an article to be contained therein,

b. first functional means arranged to insert carton blanks in succession into each of said pockets, said first functional means including means for partially folding and sealing said carton blank forming the base panel with four adjacent perpendicular side panels, the remaining panels attached to at least one of said side panels being left unfolded and unsealed,

c. second functional means arranged to insert at least one article into each of said partially folded cartons in succession while said partially folded cartons are retained in said pockets,

d. at least one further rotatably mounted drum having a plurality of pockets therein,



e. means for transferring each partially folded carton with the article contained therein between two pockets, each in a different drum,

f. third functional means arranged to fold and seal the remaining panels of said carton blank to complete formation of the carton after insertion of the article, and

g. means for driving the drums intermittently to bring each partially folded carton to successive predetermined positions.

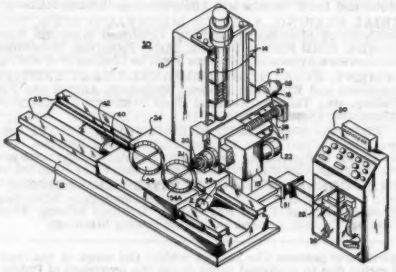
Re. 28,814
INDEX AND TABLE DRIVE MEANS FOR A MACHINE TOOL

Earl R. Lohneis, Milwaukee, and Richard E. Stobbe, Greenfield, both of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Original No. 3,587,390, dated June 28, 1971, Ser. No. 3,978, Jan. 19, 1970. Application for reissue June 20, 1973, Ser. No. 371,753

Int. Cl.[2] B23C *1/14;* **B23Q** *1/16*

U.S. Cl. 90—58 B **5 Claims**



8. In a machine tool having a bed supporting a table base for rectilinear movement along the bed, at least one index table carried by said table base and rotatably indexable about its axis;

a motor;

a first motion translating means located on said table base and operably connected to said bed to effect the rectilinear motion of said table base relative to said bed;

a second motion translating means carried by said table base and operably connected to said index table to effect the rotary motion of said index table means operable to selectively couple said motor to either said first motion translating means or said second motion translating means for

actuating said table base in its rectilinear motion or said index table in its rotary motion selectively; and

a single servo control loop for regulating the operation of said motor to control the movement of both of said tables individually so that said single servo control loop automatically regulates the operation of the longitudinally movable table in its rectilinear movement alone or the operation of the rotary table in its rotary movement alone depending upon which of said tables is being driven at the time.

Re. 28,815

SPRING SUPPORTED RAILWAY VEHICLE

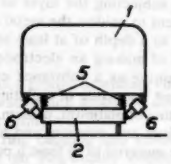
Fredrick Schmiterlow, Vasteras, Sweden, assignor to Allmänna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Original No. 3,469,538, dated Sept. 30, 1969, Ser. No. 615,600, Feb. 13, 1967. Application for reissue May 9, 1973, Ser. No. 358,519

Claims priority, application Sweden, Feb. 28, 1966, 2561/66

Int. Cl.² B61F *3/08, 5/02, 5/16, 5/24*

U.S. Cl. 105—199 R **1 Claim**



1. Rail vehicle comprising a carriage body supported by wheel bogies limited for turning and swinging and having several axles, in which between the carriage body and the wheel bogies a number of shock absorbers is arranged to damp the relative movements between carriage body and bogies, characterized in that for each bogie there are only four movement damping shock absorbers placed on both sides of the longitudinal and transverse axes of the bogie at a relatively great distance at least from the transverse axis, directed obliquely in relation to the horizontal plane to absorb both vertical and horizontal vibration forces, the longitudinal axes of the shock absorbers at least substantially coinciding with the vertical transverse plane of the rail vehicle, the distance of the shock absorbers from a transverse vertical plane through the center of the bogie being greater than or equal to one fourth of the distance between the two innermost wheel axles of the bogie.

Re. 28,816

STERN DRIVE UNIT PROPELLER TRIMMING ARRANGEMENT

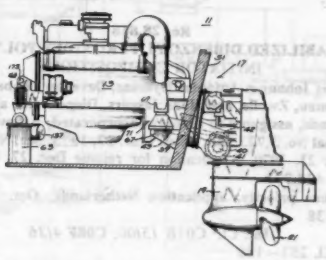
Ralph E. Lambrecht, and Harry Najiman, Jr., both of Lake Bluff, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Original No. 3,722,456, dated Mar. 27, 1973, Ser. No. 177,070, Sept. 1, 1971. Application for reissue June 14, 1974, Ser. No. 479,193

Int. Cl.² B63H *5/12*

U.S. Cl. 115—41 R **33 Claims**

2. A stern drive unit [in accordance with claim 1 wherein said means adapted for mounting said stern drive unit on the boat hull includes] *comprising an engine, a stern drive leg fixed to said engine and including a part which is tiltable vertically and swingable horizontally relative to said engine, and means adapted for mounting said stern drive unit on a boat hull including* elastomeric mounting means connected to said stern drive unit rearwardly of the front of said engine, said elastomeric mounting means providing a pivotal axis relative to which the forward end of said engine is movable, *and means connected to the front of said engine for selectively vertically tilting the forward end of said engine relative to the boat hull*



independently of vertical tilting of said part of said stern drive leg relative to said engine.

Re. 28,817

APPARATUS FOR MOULDING PLASTIC ARTICLES

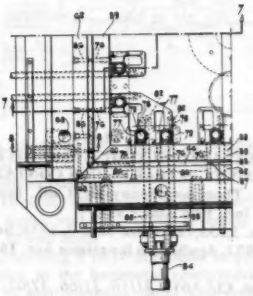
Victor William Stanley Humphrey, Radlett, England, assignor to GKN Sankey Limited, Bilston and Aro Plastics Development Limited, London, both of, England

Original No. 3,854,691, dated Dec. 17, 1974, Ser. No. 395,582, Sept. 10, 1973. Division of Ser. No. 139,376, May 3, 1971, Pat. No. 3,787,549. Application for reissue Apr. 14, 1975, Ser. No. 567,937

Claims priority, application United Kingdom, May 5, 1970, 21517/70

Int. Cl.² B29C *6/02*

U.S. Cl. 249—91 **3 Claims**



1. Apparatus for making an aperture-defining frame member [comprising] *including* a rigid frame-shaped reinforcement embedded in synthetic resinous material, the apparatus comprising mould parts which define a mould cavity having the shape of the required frame member, the mould parts including a fixed inner member, outer members movable towards and away from the inner member in first directions parallel to a fixed plane *containing said inner member* and a closing member movable towards and away from *said* inner and outer members in second directions perpendicular to said plane, a plurality of pin like projections for locating the reinforcement in the cavity, means for mounting respective pairs of said projections on said inner and outer members around said cavity to prevent movement of the reinforcement in the cavity at least in directions parallel to said plane and so that the longitudinal axis of each projection is parallel to said plane and to one of said first directions; and positively operable means *engaging respective projections mounted on said inner member* for projecting into and withdrawing from the mould

cavity those respective projections mounted on the inner member.

Re. 28,818

STABILIZED DIBENZOYL PEROXIDES POLYMER INITIATOR COMPOSITIONS

Jacobus Johannes Antonius Eymans, Deventer; Egbert Willem Holman, Zwolle, and Hans Jaspers, Diepenveen, all of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Original No. 3,723,336, dated Mar. 27, 1973, Ser. No. 83,611, Oct. 23, 1970. Application for reissue Dec. 27, 1973, Ser. No. 428,773

Claims priority, application Netherlands, Oct. 27, 1969, 6916138

Int. Cl.² C01B *15/00;* **C08F** *4/36*

U.S. Cl. 252—186 **8 Claims**

1. A non-separating, stable composition consisting essentially of, in approximate parts by weight:

(a) 20 to 60 parts of dibenzoyl peroxide or dibenzoyl peroxide having one or more substituents selected from halogen, lower alkyl or lower alkoxy;

(b) up to 20 parts of water;

(c) a hydrophobic reaction product of a pyrogenic silica with dimethyl dichlorosilane in an amount sufficient to prevent the composition from physically separating into its components, the composition having at least 2 parts of silica; and

(d) the remainder being a chemically inert plasticizer.

Re. 28,819

DIALKYLATED GLYCOL COMPOSITIONS AND MEDICAMENT PREPARATIONS CONTAINING SAME

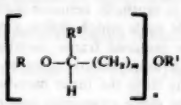
Geoffrey F. Thompson, Sunnyvale, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Original No. 3,833,725, dated Sept. 3, 1974, Ser. No. 313,431, Dec. 8, 1972. Application for reissue Apr. 16, 1975, Ser. No. 568,631

Int. Cl.² A61K *31/56, 31/66, 37/02, 47/00*

U.S. Cl. 424—243 **27 Claims**

1. A composition *containing a minimum amount of water, up to 5, and* comprising a major amount of dialkylated glycol represented by the formula:



where R and R^1 are independently lower alkyl having 1 to 6 carbon atoms, R^2 is hydrogen or a lower alkyl having 1 to 6 carbon atoms, m is an integer from 1 to 6, and n is an integer from 1 to a very large number such that the molecular weight of said dialkylated glycol is up to about 20,000, and a minor amount of at least one antioxidant for said dialkylated glycol material, said composition being substantially devoid of peroxides and other oxidation products in quantities which interfere with the carrier or stabilizing properties of said composition, *said composition being suitable for use as a vehicle for medicament preparations.*

Re. 28,820

METHOD OF MAKING AN ELECTRODE HAVING A COATING CONTAINING A PLATINUM METAL OXIDE THEREON

Henri Bernard Beer, Heide-Kalmthout, Belgium, assignor to Chemnor Corporation, Panama City, Panama

Original No. 3,864,163, dated Feb. 4, 1975, Ser. No. 237,969, Mar. 24, 1972. Division of Ser. No. 75,726, Sept. 25, 1970, Pat. No. 3,711,385, which is a continuation-in-part of Ser. No. 549,194, May 11, 1966, abandoned. Application for reissue Aug. 5, 1975, Ser. No. 602,004

Claims priority, application United Kingdom, May 12, 1965, 20133/65

Int. Cl.² B01K *3/04;* **B44D** *1/02*

U.S. Cl. 427—126 **43 Claims**

1. A method of making an electrode comprising forming on at least part of the surface of a core of a film-forming metal a layer containing at least one platinum metal taken from the group consisting of platinum, iridium, rhodium, palladium, ruthenium, rhenium and osmium, and alloys of these metals, the amount of platinum metal being sufficient, when converted to the oxide thereof, to be effective for carrying out electrolysis, and subjecting the layer to oxidizing conditions which are sufficient to oxidize the metal of said layer until the layer is oxidized to a depth of at least about 0.054 micron.

15. A method of making an electrode comprising forming a material containing as a substance effective to carry out electrolysis at least one oxide of a platinum metal taken from the group consisting of platinum, iridium, rhodium, palladium, ruthenium, rhenium and osmium, and alloys of these metals, and applying the material to at least a part of the surface of a core of a film-forming metal to form a layer on said part of the surface of the core, which layer is at least 0.054 micron thick.

33. A method of making an electrode comprising forming a solution of a material containing a salt of at least one platinum metal taken from the group consisting of platinum, iridium, rhodium, palladium, ruthenium, rhenium and osmium, the amount of platinum metal salt being sufficient, when converted to the oxide of the platinum metal, to be effective for carrying out electrolysis, contacting at least part of the surface of a core of a film forming metal with the solution, and subjecting the solution to conditions for causing a layer to be formed on the part of the surface of the core which contains, as a material effective for carrying out electrolysis, the oxide of the platinum metal, said step of contacting comprising contacting said surface of said core with sufficient solution for forming, during the subjecting of the solution to said conditions, a layer which is at least 0.054 micron thick.

Re. 28,821

PICK-UP TUBE ENVELOPE SEALANT EXTENDING INTO GROOVE OF ANNULAR TARGET SUPPORT

Ryuzo Kato, Kyoto, Japan, assignor to Matsushita Electronics Corporation, Japan

Original No. 3,714,488, dated Jan. 30, 1973, Ser. No. 181,311, Sept. 17, 1971. Application for reissue Jan. 28, 1975, Ser. No. 544,751

Claims priority, application Japan, Sept. 19, 1970, 45-82324

Int. Cl.² H01J *29/02, 31/26*

U.S. Cl. 313—390 **11 Claims**

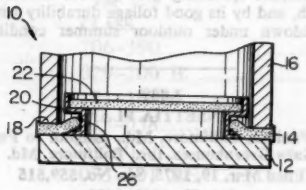
1. A target assembly of an image pick-up tube including a tubular envelope, which comprises:

a transparent face plate;

an annular binding member welded both to the inner surface of said face plate and one open end of said tubular envelope;

an annular support member supporting therein a target substrate of said image pick-up tube mounted on the back surface of said face plate, said support member having on its peripheral wall a groove extending circumferentially of the peripheral wall which groove is combined with said binding member; and

an annular signal ring capping said envelope and secured thereto through an electrically conductive paint, said signal ring being contacted at its inner surface to the peripheral wall of said binding member.



Re. 28,822

SAFETY INTERLOCK SYSTEM FOR MICROWAVE OVENS

Rex E. Fritts, Cedar Rapids, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Original No. 3,766,437, dated Oct. 16, 1973, Ser. No. 240,626, Apr. 3, 1972. Application for reissue Aug. 22, 1974, Ser. No. 499,747

Int. Cl.² H02H *5/04*

U.S. Cl. 317—40 R **9 Claims**

1. A safety interlock system for electrical apparatus comprising:

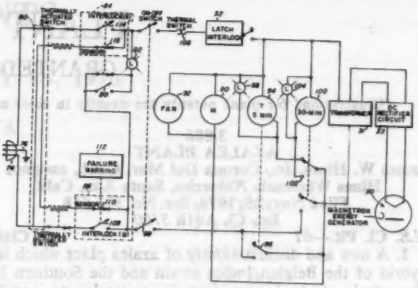
[an] electrical circuit [including] *means for coupling* a [connected] voltage source [and] *to a load;*

said circuit means comprising interlock switch means actuated by predetermined means *coupled between one terminal of said voltage source and one terminal of said load;*

sensor means *coupled in series with said interlock switch means and said voltage source* for detecting the malfunction of said interlock switch means [with];

said interlock switch means *being* normally closed and said sensor means *being* normally open when said apparatus is operative; and

resettable switch means [operatively associated with] *actuated in response to current through* said sensor means to [deenergize] *disable* said *electrical* circuit *means* upon the detection of an unsafe operating condition



[with] *when* both said interlock switch and sensor means *remain* in closed positions.

Re. 28,823

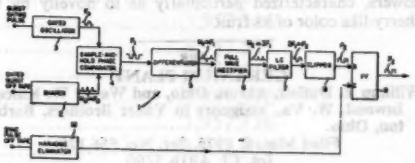
SWITCHING SEQUENCE DETECTOR FOR PAL COLOR TELEVISION

Charles H. Coleman, Jr., Belmont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Original No. 3,562,413, dated Feb. 9, 1971, Ser. No. 882,353, Dec. 15, 1969. Continuation of Ser. No. 640,187, May 22, 1967, abandoned. Application for reissue Aug. 20, 1971, Ser. No. 173,705

Int. Cl.² H04N *9/44*

U.S. Cl. 358—18 **8 Claims**



1. A system for developing a color burst phase switching sequence signal from a phase alternate line color television signal comprising in combination:

means for extracting the color burst from each line of said television signal, said color bursts reversing phase every other one of said lines;

means for generating a reference signal in predetermined time relation to the horizontal synchronizing pulse of each line of said television signal, said reference signal having a constant pulse with respect to said synchronizating pulses;

means for comparing the phases of said color bursts and said reference signal to generate a burst phase representative signal varying in amplitude at half the color burst phase switching rate of said television signal; and

means for doubling the frequency of said burst phase representative signal to thereby produce a burst-switching sequence signal at the color burst phase switching rate of said television signal.

PLANT PATENTS

GRANTED MAY 18, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,886
AZALEA PLANT

James W. Hines, Jr., Corona Del Mar, Calif., assignor to Hines Wholesale Nurseries, Santa Ana, Calif.

Filed Nov. 25, 1974, Ser. No. 526,618
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—57 1 Claim

1. A new and distinct variety of azalea plant which is a hybrid of the Belgian Indica strain and the Southern Indica strain, and characterized in particular to novelty by its ability to grow and flower in full sun or light shade in the southern California area without tip burning of the leaves or blasting of the flowers; by its abundant and rich green foliage and compact and dense habit of growth; by the unique fluorescent-like color of its flowers; and by its profuse flowering; and by its greater salts tolerance, making it less subject to root diseases common to other varieties grown in the same general area of the Irvine Ranch

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3,887
PYRACANTHA PLANT

James W. Hines, Jr., Corona Del Mar, Calif., assignor to Hines Wholesale Nurseries, Santa Ana, Calif.

Filed Nov. 25, 1974, Ser. No. 526,638
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—54 1 Claim

1. A new and distinct variety of Pyracantha with white flowers, characterized particularly as to novelty by the cherry-like color of its fruit.

3,888
GERANIUM PLANT

William E. Duffett, Akron, Ohio, and Walter W. Knicely, Inwood, W. Va., assignors to Yoder Brothers, Barberton, Ohio

Filed Mar. 6, 1975, Ser. No. 556,128
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of geranium characterized particularly by its medium lavender flower color with minimal color oxidation, prolific flowering traits under outdoor summer conditions in Ohio, medium green glossy foliage, compact spreading growth with medium internode length, and by its good foliage durability with minimal breakdown under outdoor summer conditions in Ohio.

3,889
POINSETTIA PLANT

John W. Fantom, Baltimore, Md., assignor to Fantom & Gahs Greenhouses, Inc., Baltimore, Md.

Filed Mar. 19, 1975, Ser. No. 559,815
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—86 1 Claim

1. A new and distinct cultivar of poinsettia plant characterized particularly by its variegated bracts, which have a generally brick red base color and pink spots and blotches.

3,890
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William Erwin Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Apr. 16, 1975, Ser. No. 568,569
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—76 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant characterized particularly by uniqueness in the combined characteristics of standard inflorescence type, incurved inflorescence form, 5 to 6 inch diameter across face of inflorescence at maturity, purple abaxial ray floret color with lavender adaxial color, tall plant height, semi-upright branching habit, uniform nine week flowering response period, durable leathery textured foliage, and uniform gradeout.

PATENTS

GRANTED MAY 18, 1976

ERRATA

For CLASS	See PATENT NO.
206–390	3,956,782
029–200 B	3,956,801
171–16	3,957,000
075–058	3,957,502
075–077	3,957,503
075–101 BE	3,957,504
075–108	3,957,505
075–108	3,957,506
075–134	3,957,507
075–206	3,957,508
096–001 R	3,957,509
096–001 PE	3,957,510
096–001 E	3,957,511
096–035.1	3,957,512
096–048 R	3,957,514
096–048 HD	3,957,515
096–053	3,957,516
096–061 R	3,957,517
096–064	3,957,518
324–029	3,957,592
526–011.1	3,957,736
526–207	3,957,739
526–016	3,957,740
526–312	3,957,741
526–261	3,957,742
526–154	3,957,743
526–073	3,957,744
178–026 R	3,958,088

PLANT PATENTS

GRANTED MAY 18, 1976

ERRATA

PATENTS

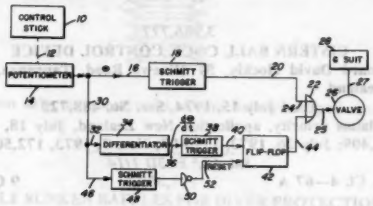
GRANTED MAY 18, 1976

GENERAL AND MECHANICAL

3,956,772
CONTROL SYSTEM FOR PRE-INFLATION OF PILOT'S G-SUIT

Lyndon S. Cox, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 11, 1975, Ser. No. 595,210
Int. Cl.² B64D *25/02*
U.S. Cl. 2—2.1 A **8 Claims**



1. A system for pre-inflating a G-suit comprising:

means responsive to positional changes of an aircraft control stick for generating an electrical signal indicative thereof;

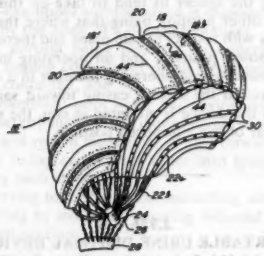
first means connected to the output of the generating means for detecting the presence of an electrical signal, from the generating means, beyond a preselected threshold level; and

valve means connected to the output of the first threshold detecting means, the valve means assuming a first state when the threshold level is exceeded, thereby inflating a G-suit connected to the valve means, a second state of the valve means being assumed when the output of the first threshold detecting means drops below the preselected threshold level, resulting in the deflation of the G-suit.

3,956,773
CUSTOM FITTED, LIGHT WEIGHT, AIR CONDITIONED PROTECTIVE HELMET

Gloria T. Chisum, Philadelphia, Pa., assignor to The Unites States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 25, 1974, Ser. No. 463,944
Int. Cl.² A42B *3/00*
U.S. Cl. 2—6 **12 Claims**



1. A helmet comprising:

a helmet shell having a plurality of holes therethrough;

a flexible sheet;

means for attaching a first surface of said flexible sheet to one surface of said helmet shell; and

a plurality of flexible cell pairs attached to the second surface of said sheet wherein each cell pair comprises at least two chambers separated by a partition;

means for removing the partition separating the two chambers comprising each of the plurality of cell pairs;

a plurality of air ducts interposed between said plurality of cell pairs; wherein each means for removing comprises,

a paddle spanning said partition;

a first string movable within one of said two chambers and connected to a first end of said paddle;

a second string movable within the second of said two chambers and connected to a second end of said paddle;

said paddle positioned at a first end of said cell pair; and

said first and second strings extending from said paddle to a second end of said cell pair.

3,956,774
ITEM OF APPAREL

Ken Spaulding, New York, N.Y., assignor to Spaldero Design, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 431,246, Jan. 7, 1974, abandoned. This application Dec. 6, 1974, Ser. No. 530,252
Int. Cl.² A41D *13/02*
U.S. Cl. 2—79 **2 Claims**

1. An item of outer apparel comprising a trouser-like nether portion and an upper part for extending over the shoulders of a wearer, said item comprising at least two panels joined at a seam extending through a crotch region of the item, a sliding clasp fastener closing said seam to allow the seam to be opened and closed, material of the panels adjacent said seam constituting means for hiding said fastener when said seam is closed, said seam extending continuously from above a waist region at the front of the item, through the crotch region and upwardly at least to a shoulder blade region at the back of the item, said fastener constituting means for opening said seam and allowing the opened seam to be spread apart to facilitate the lowering of a nether undergarment without removing said upper part of said item from the shoulders of the wearer.

3,956,775
ROTATOR FOR PROSTHETIC ANKLE JOINT

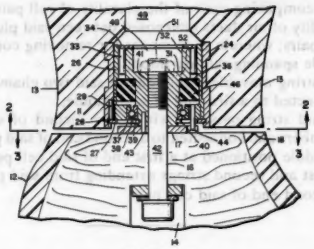
Robert R. Moore, 5401 San Leandro St., Oakland, Calif. 94601

Filed Feb. 18, 1975, Ser. No. 550,449
Int. Cl.² A61F *1/04, 1/08*
U.S. Cl. 3—33 **11 Claims**

1. A device for joining a prosthetic appendage to a prosthetic limb, comprising;

housing means disposed in said limb,

a rotating member disposed within said housing means,
bearing means disposed in said housing means for rotatably supporting said rotating member,
resilient means joined to said rotating member and said housing means and disposed therebetween,



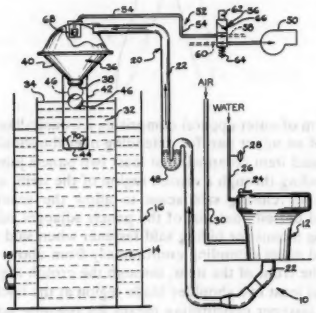
anchor means for securing to said rotating member an anchor member extending from the prosthetic appendage,
said rotating member comprising a cylindrical member having a radial outwardly extending annular shoulder at the upper end thereof.

3,956,776

LIQUID WASTE MATERIAL CONVEYING SYSTEM FOR TOILETS AND THE LIKE

Christiaan J. H. Vanden Broek, Ann Arbor, Mich., assignor to Thetford Corporation, Ann Arbor, Mich.

Filed May 28, 1975, Ser. No. 581,496
Int. Cl.² E03D *11/02, 11/00;* **B60R** *16/04*
U.S. Cl. 4—10 **12 Claims**



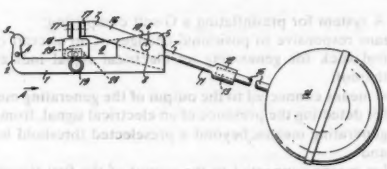
1. A pneumatic conveying system that comprises a receptacle for receiving liquid waste material, a receiving tank to which the liquid waste material is to be transferred and in which liquid material will be maintained at a normal level, and vacuum transfer apparatus for intermittently transferring liquid waste material from said receptacle to said receiving tank, said vacuum transfer apparatus comprising a surge tank mounted above said receiving tank and having a discharge port in its bottom wall located above the normal level of liquid waste material in said receiving tank, a lift conduit surrounding said discharge port and extending downward into said receiving tank a distance sufficient to have its open lower end below said normal level of liquid waste material, a ball float in said lift conduit for floating on the surface of liquid waste material and of a diameter sufficient to close said discharge port when the float is elevated into engagement therewith, a suction conduit providing communication between said receptacle and said surge tank, a vacuum pump, and control means associated with said vacuum pump and said surge tank and operable to utilize the vacuum pump to induce a pressure drop in the surge tank and thereby in the lift conduit in response to a signal generated at said receptacle so that the liquid waste material in said lift conduit rises pneumatically and positions said ball float in a sealing relation under said discharge port and thereafter liquid waste material can be transferred pneumatically from said receptacle to said surge tank for subsequent deposit in said receiving tank.

3,956,777

CISTERN BALL COCK CONTROL DEVICE

Leonard David Hockly, 57 Hinewa Road, Tauranga, New Zealand

Filed July 15, 1974, Ser. No. 488,725
Claims priority, application New Zealand, July 18, 1973, 171,409; July 26, 1973, 171,497; Nov. 7, 1973, 172,502
Int. Cl.² E03D *1/14*
U.S. Cl. 4—67 A **9 Claims**



1. A cistern ball cock control device comprising an arm adapted at one end for mounting to a ball cock as an actuating arm therefor, a second arm disposed in the same plane as said actuating arm, the actuating arm being pivotally connected adjacent its other end to an intermediate position of said second arm, one section of the float arm, considered as divided into two sections at the intermediate position thereof at which it is pivotally connected to the actuating arm, being adapted to support a float, the other section of the float arm being a non-float support section, a spacer movably mounted to one of said arms, the movable mounting of the spacer enabling movement of the spacer between two positions, one position being that where the spacer is interposed between the actuating arm and the non-float support section of the float arm such that the actuating arm and the float support section of the float arm are disposed in a non-aligned formation, means urging the spacer to tend to take-up this interposed position, the other position being that where the spacer extends laterally with respect to said plane and therefore is clear of that interposed position, and an operating member, and means for mounting said operating member in a cistern so as to extend through the cistern casing toward said spacer to enable, when the device is mounted in situ, the spacer to be displaced clear of the interposed position.

3,956,778

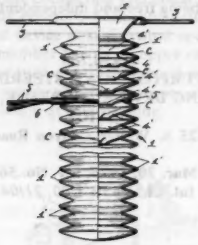
PORTABLE URINE DISPOSAL DEVICE

Yuji Tanaka, 16-411, 3-chome, Aoto, Katsusika, Tokyo, Japan

Filed June 5, 1975, Ser. No. 584,162
Int. Cl.² A47K *11/02;* **E03D** *13/00*
U.S. Cl. 4—110 **8 Claims**

1. A portable urine disposal device comprising a flexible bellows-shaped main body having a closed bottom and a flared open upper end, a plurality of annular members each having the outer periphery integrally connected to the reduced diameter inner periphery of the juncture between each two adjacent pleat units of the upper portion of said bellows-shaped

main body adjacent to said flared open end and a binding string placed about the outer periphery of one juncture between two selected pleat units of the bellows-shaped main body.



3,956,779

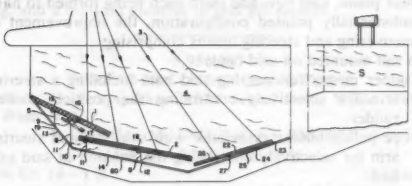
TIPPABLE SUNKEN BAFFLES FOR DIVER PROTECTION IN POOLS

Harold A. Jewett, 5451 42nd St., NW., Washington, D.C. 20015

Continuation-in-part of Ser. No. 533,256, Dec. 16, 1974. This application July 15, 1975, Ser. No. 596,173

Int. Cl.[2] E04H *3/16, 3/18*

U.S. Cl. 4—172 **9 Claims**



1. In combination:

a swimming pool having a diving zone comprising frontwardly-downwardly sloping bottom walls, and containing water,

a safety baffle submerged in said water,

anchorage means affixed to said baffle for mooring it to a said bottom wall, said baffle comprising a buoyant forward portion containing a cushioning material underlying a platform-like upper surface which is disposed for being contacted by the body of a descending diver,

said forward portion being disposed to undergo tabular downward tipping consequent on its said upper surface being thus contacted, and

a layer of subambient pool water underlying said forward portion, whereby such tipping causes egress of water from said layer, and return movement of said forward portion is aided by re-ingress of pool water into space initially occupied by such water,

said egress serving to cushion said contacting, and said re-ingress serving to moderate ensuring rebound action of such forward portion.

3,956,780

SLIDABLY MOUNTED CLOSET STRUCTURE

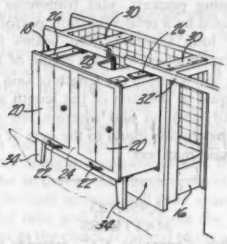
Don A. Carnes, 4261 Grange Hall Road, Holly, Mich. 48442

Filed Apr. 23, 1975, Ser. No. 570,745

Int. Cl.[2] A47K *3/00*

U.S. Cl. 4—173 R **4 Claims**

1. An apparatus comprising a closet structure, a bathing facility, and means including a frame for slidably mounting said closet structure between a first and second position, said closet structure in said first position being disposed vertically above and covering said bathing facility, said closet structure in said second position being laterally displaced from said bathing facility thereby uncovering said bathing facility so that said bathing facility may be utilized for bathing.



3,956,781

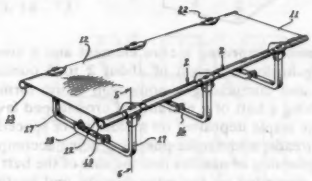
COLLAPSIBLE COT ASSEMBLY

Otto M. Reemelin, 2336 W. Keim, Phoenix, Ariz. 85015

Filed Dec. 16, 1974, Ser. No. 532,816

Int. Cl.[2] A47F *1/00*

U.S. Cl. 5—114 **7 Claims**



1. An apparatus for a collapsible cot having sheet means for supporting a load; rail means for holding said sheet means; a plurality of leg means for positioning said rail means a predetermined distance above a floor; joint means for interconnecting said leg means and said rail means; and wherein the improvement comprises:

a plurality of insertable pin means extending through said leg means for locking said joint means to said leg means and extending through said rail means for locking said joint means to said rail means, thereby forming a stable structure.

3,956,782

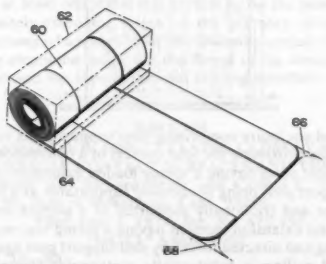
CONTOUR MATTRESS COVER

Robert D. Morrison, Worthington, Ohio, assignor to Morrison Medical Products Company, Columbus, Ohio

Filed Sept. 19, 1974, Ser. No. 507,338

Int. Cl.[2] A47C *21/00;* **A41D** *13/04;* **A47G** *9/00*

U.S. Cl. 206—390 **1 Claim**



1. A plurality of end to end detachable contour mattress covers comprising: a flexible ribbon sheet having its opposite

sides folded back onto the same surface of itself and having longitudinally spaced transverse seams connecting interfacing layers of said sheet to form and close the ends of a plurality of inwardly opening pockets, said transverse seams being alternately separated by a relatively short perforated segment and a relatively long segment, said seams further being rounded in correspondence with the shape of the ends of a selected mattress and wherein the length of said long segment is substantially equal to the sum of the length and the thickness of a selected mattress and wherein the width of said folded sheet is substantially equal to the sum of the width and the thickness of said mattress.

3,956,783
MATTRESS

Frederick L. Stoller, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

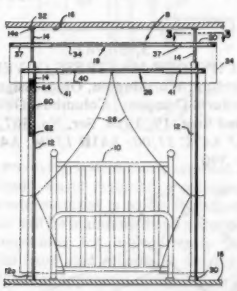
Filed Oct. 21, 1974, Ser. No. 516,477
Int. Cl.² B32B *5/06;* **A47C** *27/08*
U.S. Cl. 5—345 R **3 Claims**

1. A mattress comprising a core element and a covering, said covering having a weight of about **2** to **6** ounces per square yard and comprising a nonwoven fabric formed by needle punching a batt of a plurality of crosslapped layers of polypropylene staple deposited on a plurality of spaced polyester warp threads, said needle punching being accomplished by forcing a plurality of needles into the side of the batt opposite the side deposited on the warp threads, and heating the side of the resulting needle punched material opposite the side that the needles entered in order to fuse the surface thereof.

3,956,784
PORTABLE BED CANOPY

Joe M. Vargas, 1551 Madison Ave., Oakland, Calif. 94612

Filed Jan. 2, 1975, Ser. No. 538,198
Int. Cl.² A47C *29/00*
U.S. Cl. 5—362 **6 Claims**

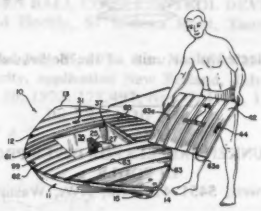


1. A bed enclosure comprising: four support posts vertically arrangeable proximate the four corners of a conventional bed, said support posts having a spring loaded extension element, each support post being frictionally supportable at a first end on a floor and frictionally supported at a second end on a ceiling, said extension element having a spring bias means for generating end directed forces by said support post against the floor and ceiling; a substantially rectangular frame having means for connecting said frame to each of said four support posts above the floor and means for adjusting the size and position of said frame with respect to said support posts; and, an enclosure material connected to and supported by said frame for enclosing, at least in part, the bed said four support posts and frame being free and independent of the bed.

3,956,785
MULTIPURPOSE BOAT, STEERING AND MANEUVERING DEVICE THEREFOR, AND CLEAT DEVICE

Leon Halfon, 3625 S. Winter Canyon Road, Malibu, Calif. 90265

Filed Mar. 20, 1975, Ser. No. 560,250
Int. Cl.² B63B *3/00, 21/04*
U.S. Cl. 9—6 P **44 Claims**



41. In a multipurpose boat having an elongated substantially hollow buoyant body, said body having a bow and stern and being substantially symmetrical about both its vertical transverse center plane and its vertical longitudinal center plane, said bow and stern each being formed to have a substantially pointed configuration, the improvement of maneuvering and steering means comprising:

a sail mounted on said boat;

rudder means for steering said boat including a steering arm for selectively controlling the position of said rudder;

rope-pulley means associated with said sail and steering arm for selectively controlling the position of said sail; and

a cleat mounted on said steering arm for receiving the rope of said rope-pulley means, said cleat being operable to hold said rope, said cleat having a base and defining a substantially V-shaped slot opening outwardly from said base, said slot having an entrance and exit portion, the exterior portion of said cleat adjacent said slot exit sloping forwardly and downwardly from said slot exit towards said cleat base to provide and define a slot exit edge surface around and over which a rope may be pulled to set the rope therein, the walls of said slot having rope gripping ridges formed therein to slant forwardly and inwardly towards said base whereby said rope may be set in said cleat by being inserted in said slot and pulling thereon around and over said exterior cleat portion and slot exit edge surface and selectively removed therefrom by placing tension on said rope and pulling away from said slot.

3,956,786
LIFE PRESERVER VEST

Maurice H. O'Link, St. Cloud, Minn., assignor to Stearns Manufacturing Company, St. Cloud, Minn.

Filed Jan. 23, 1975, Ser. No. 543,407
Int. Cl.² B63C *9/10*
U.S. Cl. 9—345 **7 Claims**

3. A personal flotation device including:

a. a collar comprising a pair of cooperating front and rear collar sections, each including a buoyant element, said sections cooperating to define a transversely generally central opening for reception of the neck of a wearer, said

front section having an outer peripheral portion remote from said neck receiving opening;

b. means pivotally connecting said collar sections together on a normally generally horizontal axis extending transversely of the device at said central opening;

c. a front bib member having an upper end secured to the front collar section at said peripheral portion thereof;

d. a rear back member having an upper end secured to the rear collar section at said opening;

e. said bib and back members having transversely extending lower portions;

f. fasteners on said lower portions for releasably attaching the lower portions of one of said members in overlapping relationship to the lower portions of the other of said members to dispose said members in snugly encompassing relationship to the chest portion of the wearer and provide side portions that cooperate with said collar to define armholes;

g. and a buoyant element in said bib section.

3,956,787

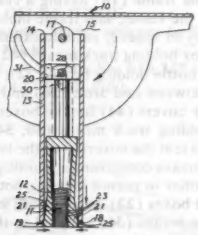
THREAD RECONDITIONING TOOL

William H. Crumpacker, 1538 School Ave., Walla Walla, Wash. 99362

Filed Dec. 16, 1974, Ser. No. 533,082

Int. Cl.² B23G *1/28, 5/10*

U.S. Cl. 10—1 B **3 Claims**



1. A stud thread reconditioning tool, comprising:

an elongated hollow tube having an opening continuous along its length;

a handle mounted to one end of the tube for movement thereon about a pivot axis transverse to the tube;

an expandable and retractable collet chuck having a cross section complementary to the tube opening and longitudinally slidably carried within the tube with one end projecting from a remaining tube end;

a longitudinal guide slot formed within the tube;

a follower pin on the collet chuck projecting outwardly therefrom through the slot;

an arcuate slot cam means formed within the handle slidably receiving the follower pin for moving the collet chuck longitudinally within the tube between an extended and a retracted position within the tube;

interconnected jaws on the collet chuck spaced apart about a central stud receiving opening by longitudinal slots formed in the collet chuck, each jaw including interior thread cutting surfaces;

each jaw further having an exterior cam surface extending outward from the remaining end of the tube, said cam surface tapering longitudinally from a reduced cross section located within the tube and of a dimension smaller than the cross sectional dimension of the tube opening to an enlarged cross section outward of the remaining end of the tube of greater cross sectional dimension than the tube opening, the respective cam surfaces of the jaws being in engagement with the remaining end of the tube so that as the chuck is drawn to the retracted position the cam surfaces will slide against the remaining end of the tube and thereby force the jaws radially together and as the chuck is moved to the extended position the cam surfaces will slide against the remaining end of the tube and thereby allow the jaws to move radially apart.

3,956,788

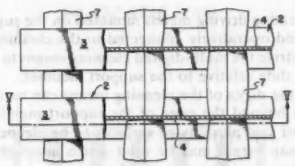
BRIDGE FLOOR AND METHOD OF CONSTRUCTING SAME

Harry S. Nagin, 5000 Boardwalk, Apt. 1512, Ventnor, N.J. 08406

Filed Oct. 23, 1974, Ser. No. 517,088

Int. Cl.² E01D *19/12*

U.S. Cl. 14—73 **20 Claims**



1. A bridge floor and like structure supported on floor-supporting members in the bridge structure comprising:

a. spaced parallel structural sections each having a flanged top and a vertical web below the top,

b. cross brace members passing through the webs of the several structural sections at intervals along their length at a level where the cross brace members are spaced below the flanges at the tops of said sections where they are clear of any traffic moving over the structural sections, said bracing members holding the structural section is fixed spaced relation and constituting load-distributing members, and

c. deck strips extending lengthwise of the structural sections of a width in a range greater than the width of the flanged top of a single structural section up to a width sufficient to span a plurality of sections, the deck strips having downwardly and inwardly-curled edges that extend according to the width of the strip under the opposite edges of at least one structural section up to the remotest oppositely-extending edges of the plurality of structural sections which they span, the inwardly-curled edges having clearance below the top flange of the structural section and the tops of the said bracing members.

3,956,789

CLEANING TOOL FOR CLEANING CLOSELY SPACED ELECTRICAL CONTACT SURFACES AND THE LIKE

Leon Shults, 425 Richard Drive, and Carlton C. Zinn, 201 Cliff St., both of McFarland, Calif. 93250

Filed June 3, 1974, Ser. No. 475,496

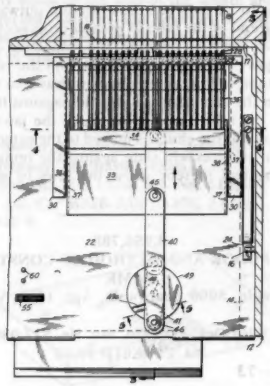
Int. Cl.² A46B *13/02*

U.S. Cl. 15—88 **8 Claims**

1. A cleaning apparatus comprising, in combination:

a support member adapted to be mounted onto a supporting frame;

multi-digited cleaning means slidably attached to the support member, the axis of the digits forming a plane, the cleaning means being slidable in a plane substantially parallel to the support member and to the plane formed by the axes of the digits, each of the digits having a surface provided with nap means of a sufficient length so as to be adapted to wipe a plurality of surfaces to be cleaned;



reciprocating driving means mounted on the support member and operatively connected to the cleaning means so as to drive the multi-digited cleaning means to reciprocatingly slide relative to the support member;

so that the digits of the cleaning means can reciprocatingly move beyond the edge of the support member and rub against said plurality of surfaces to be cleaned, whereby said nap means may be used and is adapted to retain a cleaning fluid for aiding in the cleaning operation.

3,956,790

METHOD OF APPARATUS FOR REMOVING DUST FROM THE SURFACE OF A MOVING WEB

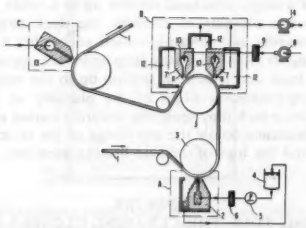
Mamoru Ishiwata; Katzutaka Yoshida, and Hiroshi Nozawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Division of Ser. No. 326,223, Jan. 24, 1973, abandoned, which is a continuation-in-part of Ser. No. 90,239, Nov. 17, 1970, abandoned. This application July 23, 1974, Ser. No. 491,009

Claims priority, application Japan, Nov. 18, 1969, 44-92399

Int. Cl.² A47L *5/38*

U.S. Cl. 15—302 **5 Claims**



1. Apparatus for removing dust from a moving web, said apparatus comprising:

a. a fountain washer having a discharge slot defined by two lips, the upstream lip being spaced further from the moving web during use of the apparatus than the downstream lip, whereby the overflowing liquid flows in the direction opposite to the running direction of the web during use of the apparatus, and

b. a liquid removing means downstream of said fountain washer, said liquid removing means comprising:

i. means for giving the moving web a localized curvature;

ii. means for blowing compressed air against the outer surface of the curved moving web at an angle to the surface the absolute value of which is between 0° and 30°, thereby creating a mist of the washing liquid, and

iii. means for exhausting the mist and the blown air from the vicinity of the moving web.

3. Apparatus as recited in claim 1 and further comprising means for recirculating the washing liquid.

3,956,791

BOTTLE WASHING MACHINE

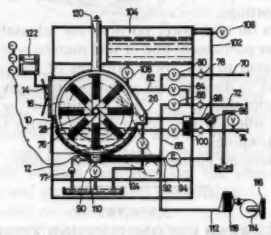
Werner Rütten, Erkrath, Germany, assignor to Anton Huber, GmbH & Co. KG, Freising, Germany

Filed Dec. 9, 1974, Ser. No. 530,963

Claims priority, application Germany, Dec. 18, 1973, 448201[U]

Int. Cl.² B67B *1/06*

U.S. Cl. 15—302 **12 Claims**



1. Bottle washing machine comprising

a vessel (**10**) adapted to hold a treatment liquid;

a plurality of bottle holding boxes (**22**) adapted to hold the bottles (**24**) to be cleaned;

a rotatable frame (**16**) having a central shaft (**28**) located within the vessel, said frame including

a plurality of spaced, radially extending arms (**36**) formed with box holding track means (**42**) for seating the bottom of the bottle holding boxes (**22**), said boxes being insertable between said arms (**36**) and being open at the top;

separable covers (**44**) for the boxes;

cover holding track means (**50, 54**) formed on the arms (36) to seat the covers over the boxes, at least one of said track means comprising a plurality of tracks spaced above each other to permit locating bottles of different heights in said boxes (**22**) and beneath said covers (**44**);

and drive means (**36**) coupled to the frame (**16**) to rotate the frame within the vessel, and hence expose the bottles in their holding boxes to the treatment liquid.

9. Machine according to claim **1**, further comprising air supply means (**112–120**) including air cleaning means (**116, 118**) connected to supply clean air to the interior of the vessel (**10**).

3,956,792

HANDLE FOR POTS AND RECEPTACLES

Wolfgang Fischbach, Daaden, Sieg, Germany, assignor to Heinrich Baumgarten, Eisen- und Blechwarenfabrik, Neunkirchen, Kreis Siegen, Germany

Filed Nov. 13, 1974, Ser. No. 523,605

Claims priority, application Germany, Nov. 17, 1973, 2357431

Int. Cl.² A47B *95/02*

U.S. Cl. 16—114 A **7 Claims**

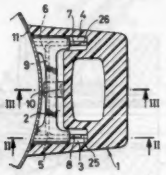
1. A handle for a container, comprising:

a connecting member secured to a wall of said container and having a supporting arm extending outwardly therefrom;

spring engaging means on said supporting arm spaced outwardly from said wall of said container;

a handle having a body with a cavity therein receiving said supporting arm and said spring engaging means therein, said cavity having at least one groove in the wall thereof extending radially of said wall of said container, said groove being in vertical alignment with said spring engaging means and spaced therefrom;

at least one two-arm spring having generally a V shape, said arms of said spring being received in said groove in said cavity, the sidewalls of said groove preventing lateral



movement of said spring relative to said handle, the apex of said V-shaped spring between said two arms being spaced from the bottom of said groove a distance greater than the spacing between said bottom of said groove and said spring engaging means when said handle is mounted on said connecting member, an inclined arm of said spring between said bottom of said groove and said apex being engaged by said spring engaging means to urge said arms remote from said apex into said groove and an interior surface of said cavity into engagement with said supporting arm and said apex being located between said spring engaging means and said wall of said container for holding said handle into engagement with said connecting member.

3,956,793

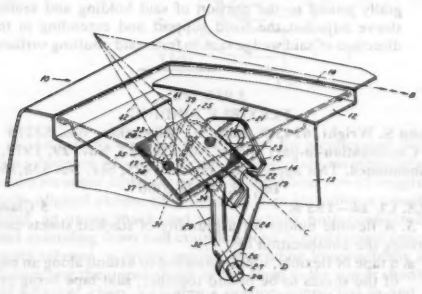
CLOSURE HINGE

Gordon R. Jewell, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 3, 1975, Ser. No. 619,347

Int. Cl.² E05D 9/00

U.S. Cl. 16—128.1 **6 Claims**



1. A hinge device for mounting in an opening in a structure, such as a vehicle body, a closure for swingable movement between closed and opened positions, comprising:

a first attachment member mounted on a structural member of the structure at one boundary of the opening and the second attachment member mounted on the closure,

the first attachment member being mounted internally of the opening and the second attachment member being mounted on the inner side of the closure,

a first hinge member pivotally coupled to the first attachment member for swinging movement about a first axis,

a second hinge member pivotally coupled to the second attachment member for swinging movement about a second axis,

pivot means pivotally coupling the distal ends of the first and second hinge members to each for swinging movement about a third axis intermediate the first and second axes,

the hinge device being mounted with its three axes obliquely positioned relative to one another and intersecting at a point outside of the surface of the closure when the latter is in a closed position in the structure opening to provide externally of the closure a pivot point about which the closure is swingable to and from an opened position.

3,956,794

DEVICE FOR SEVERING THE HEAD FROM THE NECK OF SLAUGHTERED POULTRY

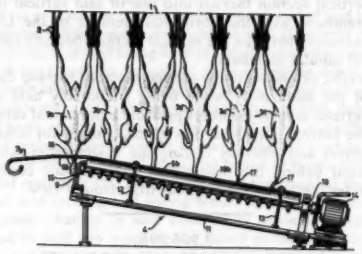
Godefriedus Hendrikus Waltherus Verbakel, Helmond, Netherlands, assignor to Stork-Brabant B.V., Boxmeer, Netherlands

Filed May 24, 1974, Ser. No. 473,302

Claims priority, application Netherlands, June 12, 1973, 7308161

Int. Cl.² A22C 21/00

U.S. Cl. 17—12 **2 Claims**



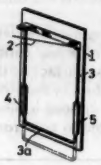
1. A device for removing the head from the neck of slaughtered poultry as the poultry is advanced along a direction of transport suspended from a substantially horizontal conveyor, comprising a pair of elongated guide members having spaced opposed edges to receive the neck of the poultry therebetween and the head being below said guide member edges, and means for displacing and diverging the neck of the poultry in the direction of transport such that the head is pulled loose from the neck at a particular location of the guide members with respect to a horizontal poultry advancing conveyor, said means comprising said guide member edges diverging in the direction of transport away from a horizontal conveyor advancing the poultry such that the distance between such a conveyor and said pair of guide members gradually increases, said guide members continuing throughout the length of travel of the head of poultry during the removal process, said means further comprising a conveyor screw beneath said spaced guide member edges and rotatable to displace the head of the poultry.

3,956,795

BROOCH SERVING AS A GLASSES HANGER

Michiko Kosakai, 28-14, 2-chome, Ehara-cho, Nakano, Tokyo, Japan

Filed Aug. 6, 1974, Ser. No. 495,538
Claims priority, application Japan, Jan. 19, 1974, 49-9202[U]
Int. Cl.[2] A44B 21/00
U.S. Cl. 24—3 R 1 Claim



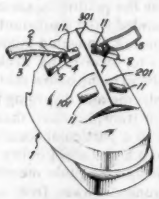
1. An ornamental device to be fastened to clothing and the like to hold glasses and other objects, said device comprising:
a main body having an ornamental front surface;
fastening means attached to the back surface of the main body for fastening the device to clothing and the like;
holding means attached to the back surface of and hidden from frontal view by the ornamental front surface of said main body, said holding means extendable from the bottom edge of said main body for holding objects hung thereover, said holding means comprised of:
two, parallel, vertical, tubular members spaced from each other and attached directly to the back of said main body, and
a moveable U-shaped member frictionally fitted at each vertical section thereof into one of said vertical tubular members, with the horizontal member of the U-shape extending between the vertical sections beneath the vertical tubular members,
whereby extending the U-shaped member beyond the edge of the main body while being frictionally held by the vertical tubular members provides a horizontal support at the bottom horizontal part of the U-shape for holding an object and whereby forcing the U-shaped member upward behind the ornamental front surface completely hides the U-shaped member from frontal view.

3,956,796

LACING DEVICE FOR SKI BOOTS

Giuseppe Guolo, Montebelluna, Italy, assignor to Calzaturificio Giuseppe Garbuio S.A.S., Treviso, Italy

Filed May 19, 1975, Ser. No. 578,815
Claims priority, application Italy, May 20, 1974, 84122/74
Int. Cl.[2] A43C 11/00; A43B 11/00
U.S. Cl. 24—70 SK 9 Claims



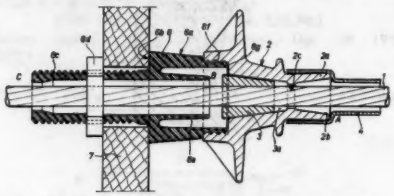
1. A ski boot including a lacing device comprising a hooked lever like member pivotably supported on a first base plate cooperating with a ring like member pivotably supported on a second base plate, said lacing device members being secured to the ski boot upper at both sides of the longitudinal ski boot opening, characterized by the fact that the said first and second base plates are in the form of slide elements, slide guides being provided on said ski boot upper to accomodate in a dismountable manner with a slide fit the said slide elements.

3,956,797

ANCHORAGE BODY FOR ANCHORING TENDONS WITH WEDGES

Antonio Brandestini, Küsnacht; Hans-Rudolf Siegwart, Kilchberg, and Gerard Welbergen, Zurich, all of Switzerland, assignors to Antonio Brandestini, Zurich, Switzerland

Continuation-in-part of Ser. No. 20,614, March 18, 1970. This application Mar. 29, 1972, Ser. No. 239,024
Int. Cl.[2] F16G 11/00
U.S. Cl. 24—126 6 Claims



1. An anchoring device for anchoring tendons with wedges, comprising:
an anchor body having a central passage therein for receiving said tendon, said passage having an inlet end and an outlet end, an outlet section of said passage widening conically toward said outlet end to form a seat for said wedges, and an inlet section of said passage widening conically toward said inlet end;
attachment means adjacent said outlet end; and
a one-piece holding and sealing sleeve coaxially and removably fixed to said attachment means on said anchor body for holding said anchor body to a fixed support, said holding sleeve having a central passage for said tendon and having a rigid wedge retaining means providing an abutting surface axially spaced from said outlet section a distance less than the length of said wedges for trapping said wedges within said outlet section, said holding and sealing sleeve having an inside diameter at its end coupled to said anchor body greater than the diameter of the passage forming said wedge seat, and said wedge retaining means comprises an inner tubular portion within the inside diameter of said holding and sealing sleeve integrally joined to the portion of said holding and sealing sleeve adjacent the fixed support and extending in the direction of said wedge seat to form said abutting surface.

3,956,798

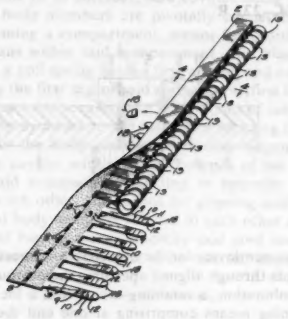
FLEXIBLE BINDING

John S. Wright, 6143 N. 60th St., Milwaukee, Wis. 53218

Continuation-in-part of Ser. No. 420,102, Nov. 29, 1973, abandoned. This application Jan. 6, 1975, Ser. No. 538,764
Int. Cl.[2] B42F 3/00
U.S. Cl. 24—153 R 5 Claims

3. A flexible binder for a plurality of stacked sheets comprising the combination of:
a. a tape of flexible, supple material to extend along an edge of the sheets to be bound together, said tape being provided with a preferential fold line extending along a longitudinal axis thereof, and at least one band-receiving aperture through it along said preferential fold line;
b. at least one band to project transversely of said tape from one edge of said band with a free end of sufficient length to pass through an aperture in a stack of sheets and to be folded back against itself to join the ends of said band to form a closed band ring in such a manner that any excess

length of the free end of said band extends through said band-receiving aperture and can be severed, said band having at least one guide marker at a precalculated distance from the free end of said band; so that when it is desired to form a band ring of a certain size, said band is folded over and inserted through the aperture in said tape



until the guide mark is viewed from said aperture at which time the guide marker no longer serves any purpose and can be severed; and

c. bonding means for bonding the joined ends of said band ring within the tape folded along said preferential fold line.

3,956,799

CONCEALED SLIDING CLASP FASTENERS

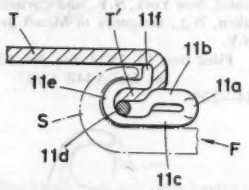
Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo K.K., Japan

Filed Dec. 27, 1974, Ser. No. 536,998

Claims priority, application Japan, Dec. 28, 1973, 49-491593[U]

Int. Cl.² A44B *19/10, 19/40*

U.S. Cl. 24—205.1 C **3 Claims**



1. An interlocking fastener element for a concealed sliding clasp fastener which comprises a filamentary member formed into a meander structure having a continuous row of longitudinally aligned clasps, each of said clasps including a coupling head, an upper shank and a lower shank both connected to and extending from said coupling head in superposed spaced-apart relation, a bridge portion extending longitudinally and connecting the upper shank of the clasp to the upper shank of an adjacent clasp, a clamping portion connected to and extending from said lower shank, said clamping portion being U-shaped to partially enclose said bridge portion and a marginal edge of a support tape on which the fastener element is mounted, and a link portion extending longitudinally and connecting the clamping portion of the clasp to the clamping portion of an adjacent clasp, said fastener element being reduced in thickness throughout a region of each clasp extending from part of said lower shank up to said link portion.

3,956,800

AUTOMATICALLY LOCKING SLIDER FOR SLIDE FASTENERS

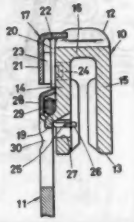
Teruaki Kawashima, Namerikawa, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Jan. 30, 1975, Ser. No. 545,580

Claims priority, application Japan, Feb. 7, 1974, 49-15865

Int. Cl.² A44B *19/30*

U.S. Cl. 24—205.14 R **1 Claim**



1. In a slide fastener slider of the type having a pull tab and a body and a locking means, said slider body including a top wing and a bottom wing which are interconnected by a web located centrally at the front end of said slider body to define a generally Y-shaped guide channel therethrough, an automatic lock mechanism comprising, in combination, a locking leaf spring generally arranged longitudinally over said top wing of said slider body and including a neck portion directly overlying said top wing, said neck portion being connected to a fold via at least one curved portion at one end of said locking leaf spring which end is arranged at said front end of said slider body, said fold being held in parallel spaced relationship to said neck portion, a pair of arms extending downwardly from both lateral edges of said fold into abutting contact with said top wing, a pair of flanges projecting laterally outwardly from parts of the bottom edges of said arms respectively, a pair of spring retainers on the top wing adapted to engage said respective flanges of said arms and hence to retain said locking leaf spring on said slider body, a locking pawl at the other end of said locking leaf spring which normally projects into said guide channel in said slider body through an aperture formed in said top wing, and a raised portion between said neck portion and integrally connected to said locking pawl of said locking leaf spring, which raised portion is linked by said pull tab in such a manner that when a pull is exerted on said pull tab, said locking leaf spring is generally raised away from said slider body whereby said locking pawl retracts away from said guide channel in said slider body, said fold having a terminal edge located forwardly of said raised portion to expose same for free movement with said locking pawl by the pull tab; and stop means operable to limit the retracting motion of said locking pawl away from said guide channel, said stop means including a stop projecting upwardly from said top wing of the slider body and received through an aperture formed in said locking leaf spring.

3,956,801

ADJUSTABLE STAKING TOOL

George P. Wood, San Diego, Calif., assignor to The United States of America as represented by the Secretary of Navy, Washington, D.C.

Filed Feb. 7, 1975, Ser. No. 547,893

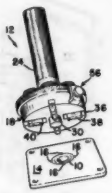
Int. Cl.² B23P *19/00*

U.S. Cl. 29—200 B **6 Claims**

1. An adjustable staking tool for different sized workpieces comprising:

a body portion;

a plurality of impression jaws;
said body portion having a plurality of radially extending guideways for supporting said impression jaws at circumferentially spaced positions around a vertical axis of said tool;
said impression jaws having fixed indenting edges;
said impression jaws being slidable in said guideways to be radially adjustable in a direction normal with respect to



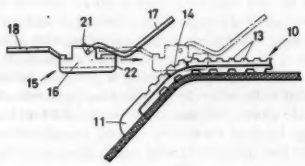
said axis for varying the diametrical spacing between said indenting edges;
means for securing the impression jaws in their radially adjusted position;
adjustable means for aligning said indenting tool with respect to different sized workpieces;
whereby the same tool can be adjusted to indent workpieces of different diameters at spaced locations thereabout.

3,956,802

RACK FOR ADJUSTABLE FASTENING DEVICE

Yoshihiro Kanzaka, Nyuzen, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Nov. 19, 1974, Ser. No. 525,093
Claims priority, application Japan, Nov. 21, 1973, 48-134846[U]
Int. Cl.² A44B *19/00*, *11/00*
U.S. Cl. 24—206 B **2 Claims**



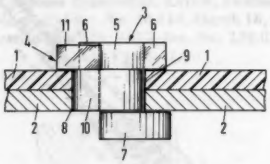
1. In an adjustable fastening device of the type comprising a rack attached to a first part, and a slider attached to a second part, said slider being adapted to be slidably mounted astride said rack and to be releasably locked in any selected position on the latter for adjustably fastening said first and second parts together, the improvement wherein said rack is flexible and has a pair of transversely registered recesses formed in the respective longitudinal edges thereof, each of said recessed having a smaller width than the length of said slider in such a manner that said pair of recesses define, when said rack is bent at a given angle at the point where the recesses are formed, a guideway through which said slider can be manipulated to and away from an astride position on said rack.

3,956,803

FASTENER

Kajetan Leitner, Am Winacker 18, D-8170 Bad Tolz, Germany

Filed June 3, 1974, Ser. No. 475,896
Claims priority, application Germany, June 4, 1973, 2328412
Int. Cl.² A44B *17/00*
U.S. Cl. 24—221 R **8 Claims**



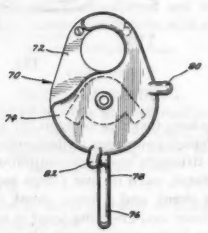
1. A fastener device for the detachable connection of panel components through aligned apertures therethrough comprising in combination, a retaining means and a locking means; said retaining means comprising at one end thereof an enlarged head portion engaging one side of said panel components, a cylindrical shank portion coaxially aligned with said head portion and connecting at the other end thereof a foot portion, said foot portion being offset from the axis of said cylindrical shank portion; a locking means having a passage therethrough eccentrically disposed for reception of said cylindrical shank portion between said head portion and said foot portion, said shank being rotatable in said passage and substantially in alignment with said foot portion in a first predetermined position in said aligned aperture of said panel components to enable insertion of the fastening device through the aligned apertures of said panel components and upon rotation to a second predetermined position, said foot portion is displaced laterally out of alignment with said cylindrical shank portion thereby engaging the opposite side of said panel components to lock said panel components together.

3,956,804

CLASP MECHANISM

Norman Gatof, New York, N.Y., and Cornelis P. Schravendeel, Weehauken, N.J., assignors to Monet Jewelers, Inc., New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 531,937
Int. Cl.² A44B *13/02*
U.S. Cl. 24—235 **5 Claims**



1. A clasp for connecting two members together comprising a first body member which includes a main body portion and a hook-shaped jaw integrally connected thereto, said body portion having first and second surfaces, a second body member which includes a main body portion and a hook-shaped jaw integrally connected thereto, said body portion having first and second surfaces, means for pivotally connecting said body members together so that hook-shaped jaws project

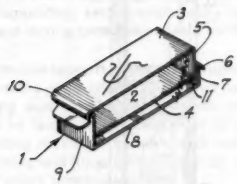
toward each other so as to form an encirclement, the ends of said jaws by-passing each other when the clasp is in a closed condition, means for limiting pivotal movement of said jaws beyond a predetermined point, said limiting means including a knob located on each jaw against which the other jaw end abuts, biasing means for urging said body members in opposite directions relative to each other about the pivot point, each body member including a cavity having a circular shape, formed in one of its surfaces, said cavities being juxtaposed when said body members are pivotally connected together thereby forming a compartment, means for positioning said biasing means within said compartment, said biasing means comprising a coil spring having first and second ends, means for securing the first end of said spring to the first body member, and means for securing the second end of said spring to the second body member, the means for securing the ends of the spring to the body members including tangential extensions of the cavities within which the ends of the spring are retained, said extensions projecting in opposite directions relative to each other, and means for gripping said clasp and pivoting said body members relative to each other against the force of said biasing means whereby said jaws can be separated so as to permit an object to be inserted therebetween.

3,956,805

STRAP CLIP

Maria E. Stroh, Astoria, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed June 16, 1975, Ser. No. 587,347
Int. Cl.² A44B *21/00*
U.S. Cl. 24—259 R **5 Claims**



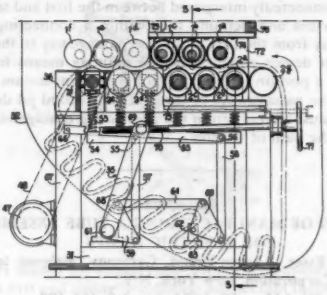
1. A strap clip comprised of a cover plate having a generally rectangular shape, one end of said plane bent to form a catch and releasing tab means, the other end of said cover plate bent vertically downwards to a pivot point, said vertically bent section continuing to a point at which a bend forms a leg parallel to said cover plate forming generally a U shaped section, said leg shorter in length than said cover plate, a base section of generally rectangular cross section bent to have two arms parallel to each other, one of the said arms terminated in a transverse lip, the other of said arms having a pivot point at the intersection of said arm and a tab bent from said arm at the free end thereof, a spring fastened to the cover plate at the end opposed from said catch and releasing tab means and to said base section at a point intermediate said arms, pivot means fastened to said vertically bent section intermediate said cover plate and said parallel leg, said pivot means fastened to said pivot point, said tab in locking engagement with said catch and releasing tab when said leg is parallel to said base.

3,956,806

ROLLER FABRIC FULLING MACHINE

Marcel Casse, 103, Rue Feray, 91100 Corbeil-Essonnes, France

Filed June 18, 1973, Ser. No. 370,696
Claims priority, application France, July 10, 1972, 72.24871
Int. Cl.² D06C *17/02*
U.S. Cl. 26—20 **10 Claims**



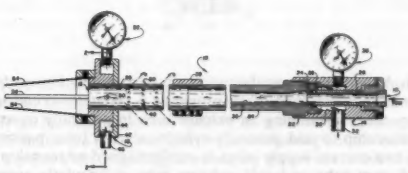
1. A multiroller fabric fulling machine comprising a frame, a plurality of adjacent first rollers and a plurality of adjacent second rollers, the first and second rollers being mounted to rotate about their axes relative to the frame, the first rollers being arranged in pairs with the second rollers so that the first roller and second roller in each pair of rollers are capable of defining a pinching gap for the passage of the fabric being fulled, each pair of rollers being relatively movable toward and away from each other, means for rotating the first and second rollers about their axes relative to the frame, means for imparting to the axis of the first roller of at least one of said pairs of rollers a cylindrical movement which movement moves the first roller toward the second roller of said one pair of rollers and varies the relative position of the two rollers of said one pair of rollers in a direction transverse to the axis of said first roller of said one pair of rollers to superimpose periodic oscillations on the rotary movement thereof.

3,956,807

JET APPARATUS FOR FORWARDING AND ENTANGLING TOW

Kenneth W. Holland, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 2, 1975, Ser. No. 574,066
Int. Cl.² D02G *1/16*
U.S. Cl. 28—1.4 **6 Claims**



1. Apparatus for forwarding a multi-filament tow comprising:

a first jet device defining therewithin a first passageway, and having means for introducing a first gasiform stream flow through the first jet device along the first passageway for moving the tow along a path through the passageway by tension exerted on the tow by the first gasiform stream flow;

a second jet device spaced from the first jet device and defining therewithin a second passageway for the path of the multi-filament tow, and having means for introducing a second gasiform stream flow onto the tow across the second passageway at about right angles to the direction of tow movement for cohesively entangling the multi-filament tow as the tow moves along the path with some of the second gasiform stream flow passing upstream of the tow movement into conflict with the first gasiform stream flow from the first jet device; and

means connectedly interposed between the first and second jet devices and defining therewithin a connecting passageway from the first jet device paasageway to the second jet device passageway and defining means for enabling a portion of the conflicting gasiform stream flows from the passageways of the first and second jet devices to exhaust laterally from the connecting passageway and from the path of the tow.

3,956,808

METHOD OF MANUFACTURING A TUBE ASSEMBLY FOR ELECTRIC LAMPS

Leonhard Esser, Aachen-Brand, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1974, Ser. No. 455,498

Claims priority, application Germany, Mar. 31, 1973, 2316255

Int. Cl.² H01J 9/18

U.S. Cl. 29—25.13 **3 Claims**

1. A method of manufacturing a tube assembly for an electric lamp which comprises: providing a generally cylindrical stem tube, positioning an exhaust tube in generally co-axial relationship to said generally cylindrical stem tube, positioning two current supply wires in axially aligned relationship to said stem tube and said exhaust tube at angularly spaced intervals intermediate said stem tube and said exhaust tube, positioning a supporting wire within one end of said exhaust tube and urging it to at least the other end of said exhaust tube and heating the stem tube and pinching the exhaust tube, stem tube, current supply wires and supporting wire to cause fusion at one common axial section of (1) said current supply wires to said stem tube and said exhaust tube, (2) said stem tube to said exhaust tube and (3) said exhaust tube to said supporting wire.

3,956,809

PRESSURE BONDED COMPOSITE MATERIAL WITH LOW YIELD STRENGTH

Joseph A. Chivinsky, Sarver, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 257,649, May 30, 1972, abandoned, which is a division of Ser. No. 177, Jan. 2, 1970, Pat. No. 3,693,242. This application May 1, 1974, Ser. No. 465,781

Int. Cl.² B32B 15/18

U.S. Cl. 29—196.1 **5 Claims**

1. A pressure bonded composite material comprising a first layer bonded to at least one layer of stainless steel along a joining interface which is substantially free from enriched carbide areas; said first layer consisting essentially of plain carbon steel containing up to 0.75% of carbide former from the group consisting of titanium and columbium, said carbide former being present in a carbide former-to-carbon ratio of from 5 to 15; said composite material having a 0.2% yield strength of less than 50,000 pounds per square inch.

3,956,810

TOOL HOLDING AND POSITIONING DEVICE

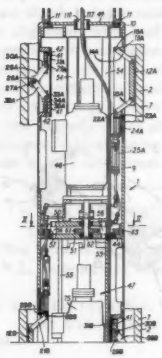
John Edward Chapman, Whyteleafe, England, assignor to Babcock & Wilcox Limited, London, England

Filed Aug. 5, 1974, Ser. No. 494,992

Claims priority, application United Kingdom, Aug. 6, 1973, 37254/73

Int. Cl.² B23P 19/00

U.S. Cl. 29—200 P **8 Claims**



1. A device for holding and positioning tools with respect to a tube sheet having wall means defining a restricted access to said tube sheet, said device comprising an elongate external frame, a plurality of radially projecting upper gripping shoes angularly spaced about the external frame and radially adjustable outwardly to frictionally anchor said device to the wall means, a plurality of radially projecting lower gripping shoes angularly spaced about the external frame and radially adjustable outwardly to frictionally anchor said device to the wall means, said lower shoes being disposed in spaced coaxial relation to said upper shoes, an elongate internal frame disposed within said external frame, and means for rotating the internal frame, said last named means including axially spaced bearings interposed between said internal and external frames, a first carriage mounted on the internal frame, and means for moving the first carriage longitudinally of said internal frame, a second carriage mounted on the first carriage, and means for moving the second carriage lineraly transverse of said first carriage, said second carriage including bracket means for holding said tools.

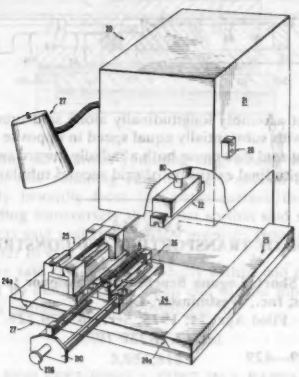
3,956,811
APPARATUS FOR TERMINATING FLAT CONDUCTOR CABLE

Kenneth Munshower, Norristown, Pa., assignor to Elco Corporation, Willow Grove, Pa.

Continuation-in-part of Ser. No. 465,593, April 30, 1974. This application Oct. 21, 1974, Ser. No. 516,500

Int. Cl.² H01R *43/04*

U.S. Cl. 29—203 D **44 Claims**



1. Apparatus for terminating flexible flat conductor means with contacts having a termination section for terminating a conductor portion of the flexible flat conductor means, the apparatus comprising:

carrier means for removably carrying a plurality of longitudinally spaced ones of said contacts;

anvil means for receiving said carrier means and for simultaneously supporting said longitudinally spaced contacts prior to and during termination, said anvil means including:

a discontinuous support surface interrupted by open ends of a plurality of longitudinally spaced receiving slots for receiving said termination sections of said contacts carried by said carrier means prior to termination,

anvil locating means cooperable with said carrier means for locating said longitudinally spaced contacts in position to effect termination; and

holding means for holding said contacts against dislodgment from said anvil during removal of said carrier means from said contacts prior to termination;

positioning means for orienting said flexible conductor means adjacent said contact-carrying anvil means with said carrier means being removed from said contacts; and

ram means movable relative to said anvil means with said flexible conductor means disposed between said ram means and said contact-carrying anvil means, for effecting simultaneous penetration of the flexible flat conductor means by said termination sections of contacts received in said receiving slots.

3,956,812
APPARATUS FOR FEEDING SLIDE FASTENER PARTS

Koichi Kawakami, Kurobe, and Tatsuo Osaki, Uozu, both of Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Japan

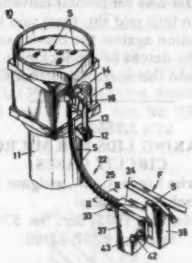
Filed Apr. 17, 1974, Ser. No. 461,628

Claims priority, application Japan, Apr. 18, 1973, 48-43870

Int. Cl.² B21D *53/50*

U.S. Cl. 29—207.5 SL **6 Claims**

1. Apparatus for feeding slide fastener sliders which comprises a feed chute comprising spaced parallel rails, first chute holding means provided at a parts feeder, a first end fitting secured to one end of said chute and removably connected to said first chute holding means, second chute holding means provided at a parts applying station, a second end fitting secured to the other end of said chute and removably connected to said second chute holding means, and positioning means adapted to retain said first and second end fittings in position relative to said first and second chute holding means, respectively said first chute holding means including releaseable



grippers biased for engagement with corresponding surfaces on said first end fitting to establish connection thereof to said first chute holding means, and said second chute holding means including a releaseable member biased for engagement with a corresponding surface on said second end fitting to establish connection thereof to said second chute holding means.

3,956,813
SLIDER HOLDER FOR THE ASSEMBLAGE OF SLIDE FASTENERS

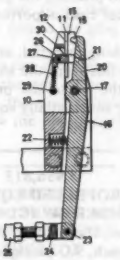
Shunichi Shigeno, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Dec. 16, 1974, Ser. No. 532,846

Claims priority, application Japan, Dec. 19, 1973, 48-142728

Int. Cl.² B21D *53/50*

U.S. Cl. 29—207.5 SL **3 Claims**



1. A device for holding a slider for the assemblage of slide fastener stringers therethrough, wherein said slider includes a pull tab having an aperture therein, said device comprising, in combination, a hollow support structure having a slider rest on its top and a slit extending downwardly therefrom to telescopically receive said pull tab of said slider when the same is placed upside down on said slider rest, a locking lever mounted within said support structure so as to be pivotable between a first and a second position, said locking lever having a detent at its top end which is adapted to engage said aperture in said pull tab telescopically received in said slit when said locking lever is in said first position and to disengage said aperture when said locking lever is in said second position, first spring means biasing said locking lever toward said first position, a retractable stop mounted within said

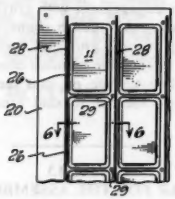
support structure so as to be pivotable between a blocking position, where said retractable stop extends across said slit to engage and retain said locking lever in said second position, and a release position where said retractable stop disengages said locking lever to permit the latter to be pivoted to said first position by said first spring means, and second spring means biasing said retractable stop toward said blocking position, said retractable stop being disposed for engagement by the pull tab of said slider and for pivotal movement by the insertion of said pull tab into said slit, from said blocking position to said release position against the bias of said second spring means to permit the detent of the locking to engage the pull tab by extending into the aperture thereof.

3,956,814

PROCESS OF MAKING LIDS FOR MICROELECTRONIC CIRCUIT GASES

Robert L. Peet, Yorba Linda, Calif., assignor to Bliss & Laughlin Ind., Inc., Anaheim, Calif.

Filed May 21, 1975, Ser. No. 579,597
Int. Cl.² B23P *17/00*
U.S. Cl. 29—414 **4 Claims**



1. A process for making lids of predetermined length and width for microelectronic circuit cases and the like, including the steps of:

masking a metal sheet in a pattern of a plurality of interconnected lids of length and width greater than said predetermined length and width;

etching the sheet to produce the plurality of interconnected lids with a thicker central portion and a thinner rim portion;

removing the masking material; and

cutting individual lids from the sheet in a stamping operation trimming the lid to the predetermined length and width providing substantially square corners at the edge of the lid.

3,956,815

EXPLOSIVELY PROPELLED EQUAL MASS TUBULAR MEMBER SWAGING TOOL

Harry Milton Capper, Harrisburg, Pa., and William Franklin Broske, Myrtle Beach, S.C., assignors to AMP Incorporated, Harrisburg, Pa.

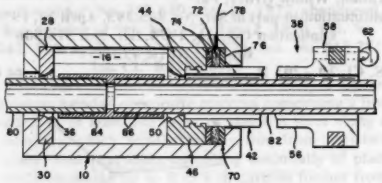
Filed May 6, 1975, Ser. No. 574,980
Int. Cl.² B32P *17/00*
U.S. Cl. 29—421 E **16 Claims**

6. An explosively propelled tool for mechanically joining first and second tubular members by swaging, which tool comprises:

a. a shell assembly defining a chamber having first and second ends adapted to fit over the adjoining free ends of the first and second tubular members, means at said first end defining an annular first die means;

b. a counterweight assembly mounted in and confined to linear motion by the chamber, said counterweight assembly including second annular die means encircling one of said tubular members and directed inwardly of said chamber, said counterweight assembly and said shell assembly having substantially equal masses;

c. propellant means positioned between the counterweight assembly and the second end of said chamber which, when ignited, drives the shell assembly and the counter-



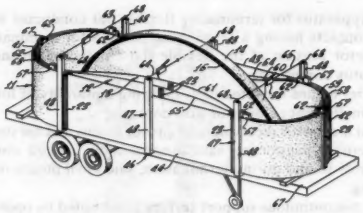
weight assembly longitudinally along said tubular members with substantially equal speed in opposite directions so that said dies cause both a radially inward swaging and a longitudinal extrusion of said second tubular member.

3,956,816

METHOD OF TRANSPORTING AND CONSTRUCTING TANKS

Robert J. Short, Laguna Beach, Calif., assignor to Justin Enterprises, Inc., Westminster, Calif.

Filed Apr. 21, 1975, Ser. No. 570,227
Int. Cl.² B23P *19/00*
U.S. Cl. 29—429 **35 Claims**



1. The method of producing a tank at a predetermined location comprising the steps of

forming at a second location remote from said predetermined location member of resilient material so as to have a substantially cylindrical configuration,

deforming said member to a noncylindrical shape so as to reduce the transverse dimension thereof in one direction while remaining within the elastic limit of said member,

holding said member in said shape,

transporting said member while so held from said second location to said predetermined location,

releasing said member at said predetermined location and allowing the same to resume said substantially cylindrical configuration,

and attaching end means to said member when so released for completing a tank.

3,956,817

METHOD OF MAKING A PIPE JOINT

James J. Blumenkranz, Hollywood, Calif., assignor to R & G Sloane Manufacturing Company, Inc., Woodland Hills, Calif.

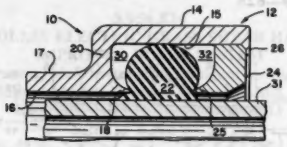
Continuation of Ser. No. 446,518, Feb. 27, 1974, Pat. No. 3,936,081. This application June 30, 1975, Ser. No. 591,900
Int. Cl.² B23P *11/02*
U.S. Cl. 29—446 **2 Claims**

1. A method of making a pipe joint comprising the steps of:

a. forming an enlarged cylindrical socket at the end of a pipe body;

b. providing a first lip spaced radially inwardly from said socket and axially from the open end of said pipe body and projecting toward said open end forming an annular groove;

c. inserting an annular seal ring into said cylindrical socket in contact with said first lip, the mean diameter of said seal ring being located radially outwardly from said first lip;



d. inserting an annular retaining ring wholly within said socket, said retaining ring having a second lip spaced radially inwardly from the outer surface thereof and extending transversely therefrom so that said second lip contacts said seal ring radially inwardly from said mean diameter of said seal ring; and

e. locking said retaining ring wholly within said cylindrical socket by deforming the open end of said pipe body to form a radially inwardly projecting lip.

3,956,818

METHOD FOR SECURING A TUBE IN A PASSAGE OF A SUPPORT

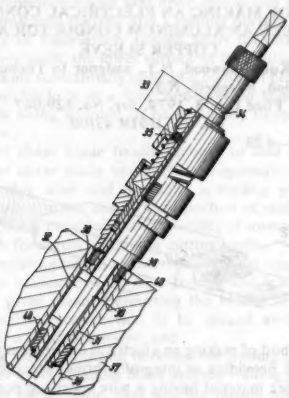
Manfred Hauschke, Muennerstadt; Walter Hesse, Hilden, and Volker Meissner, Remscheid-Lennep, all of Germany, assignors to Kotthaus & Busch, Remscheid, Germany

Filed Jan. 21, 1974, Ser. No. 435,125

Claims priority, application Germany, Jan. 15, 1973, 2301815

Int. Cl.² B21D *39/00*

U.S. Cl. 29—523 **5 Claims**



1. In a method of securing a tube in a passage of a support by expanding the tube within the passage, the steps of disposing in that portion of the tube which is located within the confines of said passage a roller tool having material-deforming rollers the axis of rotation of which extends lengthwise of but forms an angle with the longitudinal axis of the tube; rotating said roller tool about said axis of rotation in a single circumferential direction and forming with it an inner annular recess in said tube at one axial location of the latter so that a corresponding outward first deformation of the tube occurs in said passage; restraining said roller tool against displacement relative to said tube in both axial directions of said tube until said groove and said first deformation have reached a desired dimension in direction radially of said tube; terminating the step of restraining upon reaching of said desired dimension; and continuing said rotation of said roller tool in said single circumferential direction so that the roller tool now advances axially of the tube due to termination of the restraining step and forms said tube with a second outward deformation.

3,956,819

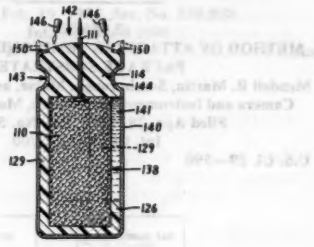
METHOD OF ASSEMBLING A TANTELUM CAPACITOR

Stephen L. Augeri, 139 Oakside Drive, Smithtown, N.Y. 11787

Filed Dec. 2, 1974, Ser. No. 528,695

Int. Cl.² H01G *9/24*

U.S. Cl. 29—570 **1 Claim**



1. A method of assembling a tantalum capacitor having an anode of finely divided, sintered tantalum, the method comprising the steps of:

bonding a plug to one end of the anode; bonding a connector to the plug, the connector extending through the plug into one end of the anode for electrically connecting the connector to the anode; bonding a spacer to the other end of the anode for forming a core unit of the bonded plug, connector, anode, and spacer; inserting the core unit, spacer end first, in a can; filling the can with a fluid electrolyte; crimping the can to the plug for sealing the can; and

bonding the plug to the can to hermetically seal the can by heating the plug in the can to heat soften the plug for bonding to the can, the plug shrinking during the heat bonding step to draw the plug against the crimp for further sealing the can.

3,956,820

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A LEAD BONDED TO A SURFACE THEREOF

George Allan Swartz, Plainsboro, N.J., and Richard Earl Chamberlain, Yardley, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 26, 1975, Ser. No. 553,150

Int. Cl.² B01J *17/00*

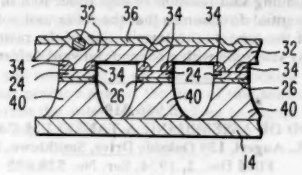
U.S. Cl. 29—577 **9 Claims**

1. In a method of manufacturing a semiconductor device having a lead bonded to a surface thereof wherein said device is fabricated by bonding said lead to a portion of a surface of a substrate comprising said surface of said device and then removing a section of said substrate surrounding said surface portion of said substrate, the improvement in said method comprising the steps of:

forming on said surface of said substrate, prior to said bonding step, a mask having an opening therein exposing said surface portion of said substrate,

depositing above said exposed surface portion, after said

bonding step, a layer of material capable of masking said substrate during said step of removing said section, and



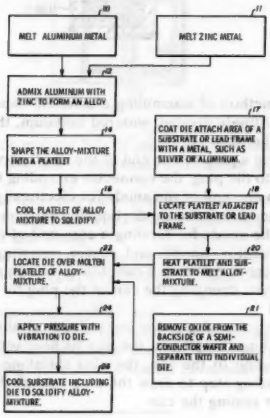
removing said mask, whereby said layer of material forms a pattern of material exposing said section of said substrate.

3,956,821

METHOD OF ATTACHING SEMICONDUCTOR DIE TO PACKAGE SUBSTRATES

Mendell R. Martin, Scarborough, Maine, assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Apr. 28, 1975, Ser. No. 572,820
Int. Cl.² B01J *17/00*
U.S. Cl. 29—590 **4 Claims**


MELT ALUMINUM METAL
MELT ZINC METAL
ADMIX ALUMINUM WITH ZINC TO FORM AN ALLOY
SHAPE THE ALLOY-MIXTURE INTO A PLATELET
COAT DIE ATTACH AREA OF A SUBSTRATE OR LEAD FRAME WITH A METAL, SUCH AS SILVER OR ALUMINUM.
COOL PLATELET OF ALLOY MIXTURE TO SOLIDIFY
LOCATE PLATELET ADJACENT TO THE SUBSTRATE OR LEAD FRAME.
LOCATE DIE OVER MOLTEN PLATELET OF ALLOY-MIXTURE.
HEAT PLATELET AND SUBSTRATE TO MELT ALLOY-MIXTURE.
APPLY PRESSURE WITH VIBRATION TO DIE.
REMOVE OXIDE FROM THE BACKSIDE OF A SEMICONDUCTOR WAFER AND SEPARATE INTO INDIVIDUAL DIE.
COOL SUBSTRATE INCLUDING DIE TO SOLIDIFY ALLOY-MIXTURE.

1. A method of attaching semiconductor die to a package substrate comprising:

a. melting an aluminum metal;

b. melting a zinc metal;

c. admixing 5% to 30% by weight of said molten aluminum metal with 95% to 70%, respectively, of said molten zinc metal to thereby form an aluminum-zinc alloy;

d. shaping said alloy mixture into a platelet;

e. cooling said platelet of said alloy mixture;

f. locating said platelet adjacent to the package substrate;

g. heating the substrate including said platelet to a temperature within the range of 400° to 440°C, wherein said platelet of said alloy mixture becomes fluidic;

h. locating the semiconductor die adjacent to said fluidic platelet on the package substrate;

i. simultaneously applying pressure with vibration to the semiconductor die; and,

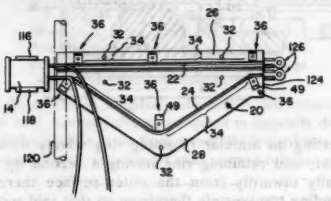
j. cooling the package substrate including the semiconductor die and the fluidic mixture of said alloy to thereby solidify the alloy mixture and attach the semiconductor die to the package substrate.

3,956,822

METHOD AND APPARATUS FOR POSITIONING INDIVIDUAL LEADS UTILIZING AN IMPROVED TEMPLATE

Kenneth Foster Folk, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 15, 1974, Ser. No. 514,349
Int. Cl.² H01R *43/00*
U.S. Cl. 29—628 **17 Claims**



1. A method for positioning successive lengths of a plurality of electrical leads in fixed spaced apart positions along a template, comprising the steps of:

providing a template with a plurality of spaced apart grooves each having sidewalls defining a width greater then the width of an electrical lead to be received by the groove,

providing said template with electrical lead retaining means at selected locations along said grooves,

engaging successive lengths of said electrical leads and progressively inserting successive lengths of said leads along corresponding grooves into retention with said lead retaining means without unduly stretching said leads, and thereby

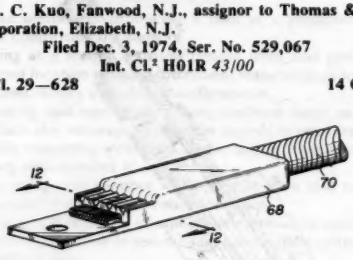
positioning ends of said electrical leads at a work station adjacent corresponding ends of said grooves.

3,956,823

METHOD OF MAKING AN ELECTRICAL CONNECTION BETWEEN AN ALUMINUM CONDUCTOR AND A COPPER SLEEVE

Ted L. C. Kuo, Fanwood, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Dec. 3, 1974, Ser. No. 529,067
Int. Cl.² H01R *43/00*
U.S. Cl. 29—628 **14 Claims**



1. A method of making an electrical connection comprising the steps of: providing an integrally formed electrical connector of copper material having a wire receiving portion and a tongue portion; selectively positioning an aluminum conductor within said wire receiving portion so that one end of said conductor extends beyond the juncture between said wire receiving portion and said tongue portion; subjecting a first given length of said wire receiving portion to a first given crimping force to cause a given length of said conductor adjacent the juncture between said wire receiving portion and said tongue portion to be uniformly compressed to a first given height and to cause a portion of said conductor to be extruded out of said first given length of said wire receiving portion; and subjecting the remaining length of said wire receiving portion to a second given crimping force to cause the remaining length

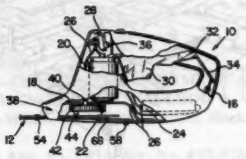
of said conductor within said wire receiving portion to be uniformly compressed to a second given height greater than said first given height, to selectively work harden said conductor in the area generally adjacent said juncture and create a sacrificial an anode thereat, the ratio of said first given height to said second given height being in the range of from 0.1 to about 0.8.

3,956,824

CORDLESS ELECTRIC GRASS SHEAR HAVING IMPROVED BLADE SYSTEM

Charles Francis, Manchester, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Oct. 1, 1974, Ser. No. 511,053
Int. Cl.² B26B *19/02*
U.S. Cl. 30—220 **10 Claims**



1. A battery powered grass shear having improved cutting and durability characteristics and lower battery drain comprising:

a housing;

battery means carried by said housing;

motor means mounted within said housing and selectively interconnectable with said battery means;

drive means disposed within said housing and operatively interconnected with said motor means;

an upper movable shear blade of hard, relatively thin, heat treatable, resilient steel and including a trailing portion interconnected with said drive means and adapted to be reciprocated thereby and a leading portion having a plurality of transversely spaced apart forwardly extending cutting teeth, the lower surface of the trailing and leading portions substantially lying in a common plane when said upper blade is in a free, non-stressed state, said upper blade being adapted to be resiliently flexed out of said plane;

a lower shear blade fixidly secured to said housing, said lower shear blade being of a comparatively thick, heat treatable steel and including a trailing portion and a leading portion, the forward portion of said leading portion being provided with a plurality of transversely spaced apart forwardly extending cutting teeth;

pivot means adapted to interconnect said upper and lower shear blades between their trailing and leading portions, said pivot means permitting the blades at the point of pivotal interconnection to be spaced away from each other a limited amount; and

bearing means disposed between the trailing portion of the upper movable shear blade and the trailing portion of the lower shear blade, said bearing means maintaining the trailing portions of the upper and lower blades in spaced apart relationship with respect to each other;

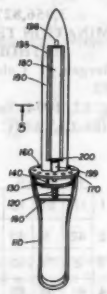
a forward portion of the leading portion of said lower blade further being inclined upwardly toward said upper blade forward of a transversely extending bend line between the pivot means and the rearward end of the forwardly extending cutting teeth, the angle of inclination of the forward portion of the leading portion of the lower blade being so selected, along with the spacing between the upper and lower shear blades permitted by said pivot means, and the spacing between the trailing portions of the upper and lower shear blades permitted by said bearing means to insure during reciprocation of the upper blade with respect to the lower blade that the angle between the forward portions of the upper and lower shear blades is sufficient to maintain point to point contact between the intersecting cutting edges of the upper and lower cutting teeth, that the upper blade is sufficiently spring loaded to maintain sufficient point contact pressure between the cutting teeth of the upper and lower blades whereby the cutting teeth will not inadvertently separate during normal operation thereof, and that the facing surfaces of said blades will not contact each other except along the point contact area between the cutting edges of the cutting teeth.

3,956,825

POTATO AND VEGETABLE PEELERS

Ralph Ness, Minot, N. Dak., assignor to Raymond Lee Organization, New York, N.Y.

Filed Feb. 19, 1975, Ser. No. 550,928
Int. Cl.² B26B *3/00*
U.S. Cl. 30—279 R **1 Claim**



1. A Vegetable And Potato Peeler with variable blade angle, comprising;

a handle,

a cross bar mounted in the handle,

a stationary disk forming the front end of the handle,

a frame mounted to the stationary disk,

a plurality of indexing holes formed in the stationary disk,

a rectangular opening formed in the central portion of the frame,

a shaftway formed in the center of the stationary disk and continuing in the base of the frame,

a slot formed in the frame at the upper edge of the rectangular opening,

a shaft mounted in the shaftway and terminating in the slot in the frame,

a blade mounted on the shaft and in the rectangular opening of the frame, and

an indexing disk mounted on the shaft and spring loaded to cooperate with the indexing holes, whereby the angle of the blade relative to the frame may be predeterminedly fixed.

3,956,826

ULTRASONIC DEVICE AND METHOD

Rene J. Perdreaux, Jr., New York, N.Y., assignor to Cavitron Corporation, New York, N.Y.

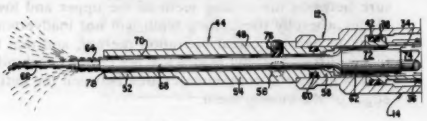
Filed Mar. 19, 1974, Ser. No. 452,627
Int. Cl.² A61C *3/06*
U.S. Cl. 32—58 **15 Claims**

1. In an ultrasonic device having a casing, an energyzing means adjacent said casing, ultrasonic vibration means mounted in said casing and activated by said energyzing

means, means for introducing fluid into an end of said casing, the improvement comprising

a hollow sleeve adapted to be insertably mounted in the end of the casing and in fluid communication therewith,

connecting means attached to one end of said vibration means and extending through said hollow sleeve, said



connecting means being mounted at a spaced distance from the internal walls of said hollow sleeve, forming an annular nozzle adjacent said hollow sleeve anterior end for fluid to exit said nozzle in substantially a 360° annular stream, and

tool means axially fixed to said connecting means at the anterior end thereof.

3,956,827

COLOR DISCRIMINATION TEST APPARATUS AND METHOD

Stephen Franklin Bergen, 1 Colonial Woods Drive, West Orange, N.J. 07052

Filed Dec. 12, 1974, Ser. No. 532,043
Int. Cl.² A61C *19/00*
U.S. Cl. 32—71 **3 Claims**

	A	B	C	D	E
1	11	51	12	52	21
2	42	3	43	13	61
3	2	73	10	53	22
4	41	33	63	23	62
5	1	72	32	71	31

1. Color discrimination test apparatus for teaching, training and educating in the dental matching of teeth, comprising: a plurality of color samples, wherein each of which is identified by a given hue, value and chroma level characteristic on the Munsell scale of color matching, wherein individual ones of which have no more than two of these identifying characteristics substantially identical, wherein the hue of each of said plurality of color samples falls within the range from approximately 8.0 yellow-red to approximately 4.0 yellow on said Munsell color matching scale, wherein the value of each of said plurality of color samples falls within the range 7.5 to 8.0 on said Munsell scale, wherein the chroma of each of said plurality of color samples falls within the range 2.5 to 4.0 on said color matching scale and wherein such differences as exist between individual samples with respect to their hues, values and chromas exceed 0.5, 0.1 and 0.2, respectively, on said scale.

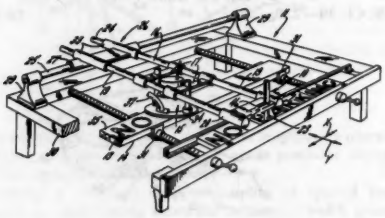
3,956,828

STYLUS FOR SIGN-MAKING MACHINE

Kenneth R. Kloweit, 1304 Leaman Place, Rockford, Ill. 61108

Filed June 23, 1975, Ser. No. 589,148
Int. Cl.² B43L *13/10*
U.S. Cl. 33—23 K **9 Claims**

1. In a machine for making a sign by routing grooves in a workpiece, the combination of a frame, a template located on said frame along one side thereof, a clamp for securing the workpiece on the frame in a preselected position relative to said template, a guide rod secured to said frame opposite said template and extending in an x direction, a carrier slidably mounted on said guide rod for movement in said x direction, an arm slidably mounted on said carrier for movement therewith in said x direction and for movement relative to said carrier in a y direction, said arm also being pivotal relative to said rod for movement in a vertical direction between a raised position and a work position extending in a generally horizontal direction, a router secured to said arm intermediate the ends thereof and being movable in said *x* and *y* directions with said arm, said router having a slide plate for engagement with the surface of said workpiece and a bit extending downwardly beyond said plate for cutting a groove in said workpiece as said router is moved with said arm in said *x* and *y* directions when the arm is in its work position, the improvement in said machine comprising a stylus mounted within the outer end



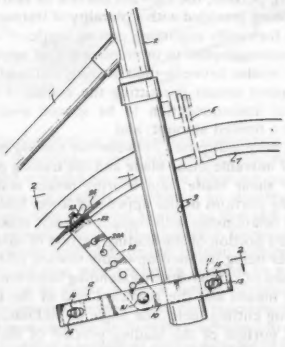
portion of said arm and having a lower tip engageable with said template to guide said router to produce a groove in said workpiece, said stylus tip being movable relative to said arm between first and second positions spaced from said arm, said tip in said first position being spaced from said arm to engage said template before said bit cuts into the workpiece as the arm is pivoted downwardly toward its work position thereby enabling said router to be aligned accurately with respect to said template before initial cutting of the groove, said stylus in its second position riding on the template with the arm in its work position to guide movement of the arm in said *x* and *y* directions, and means connected between said stylus and said arm for securing said stylus to said arm and for limiting movement of said tip between said first and second positions.

3,956,829

WHEEL TRUING AID FOR BICYCLES

Arron L. Moxon, 524 E. E St., Burns, Oreg. 97720

Filed Oct. 21, 1974, Ser. No. 516,255
Int. Cl.² G01B *3/00*
U.S. Cl. 33—203.19 **2 Claims**



1. A wheel truing aid for temporary attachment to a bicycle to provide a reference against which wheel trueness may be evaluated, said aid comprising in combination,

a base, clips of different configurations mounted adjacent opposite ends of the base facilitating attachment of the base alternatively to a bicycle fork or a seat stay of the bicycle frame,

a support member of a flexible nature having a right angular extension formed at one of its ends,

means pivotally attaching the opposite end of the support member to said base intermediate the base ends to permit positioning of the support member into radial relationship with the wheel axis, and

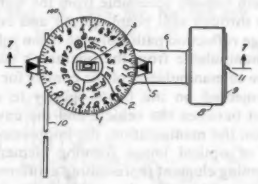
a straightedge reference member also of a flexible nature adjustably mounted on said right angular extension of said support member for positioning toward or away from a wheel rim and terminating outwardly in a straightedge for initial positioning adjacent the wheel rim whereby upon wheel rotation any out of true condition of the wheel may be evaluated, the flexible nature of said support member constituting a yieldable support for said reference member whereby said member may be displaced during a wheel truing operation.

3,956,830

WHEEL ALIGNMENT INSTRUMENT AND MEASUREMENT METHOD

Charles W. MacMillan, 3400 20th St. Ct., Rock Island, Ill. 61201

Filed Aug. 13, 1974, Ser. No. 497,070
Int. Cl.² G01B *13/195*
U.S. Cl. 33—337 **11 Claims**



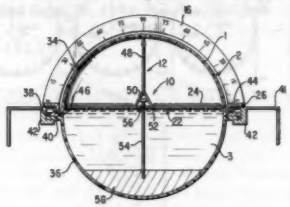
1. A vehicle wheel alignment instrument comprising a circular dial operationally oriented in a substantially horizontal plane, camber and caster graduations contained on the face and an opening in the center of said dial, a level vial operably and visably located in said opening, said dial being rotatable about an axis central and normal to its face, means communicating between said dial and said vial to produce tilting of the latter in proportion to the angle of turn of said dial, two pointers supported adjacent the periphery of said dial, one of said pointers being movable relative to the other pointer, said dial being independently rotatable relative to said pointers; said dial, pointers, and vial being additionally rotatable as a unit without relative rotation between them; a mounting body supporting said dial, pointers, and vial, said body being elongated and terminating at one end in a housing containing a circular magnet, the pole faces of said magnet being oriented in a plane vertical to the plane containing said dial, the other end of said body containing a detachable rod held rigid with said body and extending unilaterally therefrom at approximate right angles to the long axis thereof, said rod extending a distance greater than the height of said instrument from the horizontal plane on which an associated vehicle rests, said instrument being rotatable at its mounting on a wheel of said vehicle for the purpose of describing an imaginary arc in an approximate vertical plane and at the outer end of said rod, said imaginary arc terminating at two points on a plane substantially horizontal and parallel with the resting plane of said vehicle, said two points determining a line parallel with said wheel and perpendicular to a vertical plane containing the spindle axis of said wheel, said imaginary line together with a second similar line established by the same means relative to a second wheel on the opposite side vehicle providing the basis for measurement between said lines to determine the parallelism of one wheel with the other in a horizontal plane; a graduated scale held adjacent to the arcuate end of one of said rods and measuring indicating means cooperating with said scale for determining the toe measurement of said pair of wheels.

3,956,831

ATTITUDE METER WITH ROTATABLE ARCUATE SCALE

Scott F. Sibley, P.O. Box 4476, Arlington, Va. 22204

Filed Feb. 26, 1975, Ser. No. 553,088
Int. Cl.² G01C *17/00*
U.S. Cl. 33—352 **20 Claims**



1. Apparatus for measuring the orientation of a surface with respect to the direction of magnetic North and with respect to a horizontal plane, comprising

a. a support base;

b. magnetic North indicator means mounted on said support base for sensing and indicating the orientation of the surface being measured relative to the direction of magnetic North;

c. vertical indicator means mounted on said support base for sensing and indicating the vertical angle of the surface being measured, said vertical indicator means including

1. a vertical indicator having an indicator portion and a pivot portion, and

2. a vertical indicator base support means for maintaining the pivot portion of said vertical indicator at a substantially fixed point relative to said support base and for providing for substantially universal movement of said indicator portion within predetermined limits such that the locus of all points through which said indicator portion may move defines a sector of a sphere; and

d. scale means for quantifying the vertical angle sensed and indicated by said vertical indicator means, said scale means including

1. an arcuate scale having vertical angle indicia and having an inside radius of curvature slightly larger than the radius of curvature of the sphere sector defined by the movement of said indicator portion, and

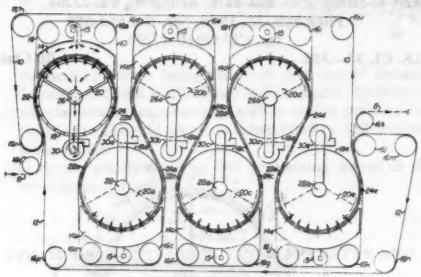
2. an arcuate scale support means for rotatably supporting said arcuate scale with respect to said support base to provide for rotation of said arcuate scale to sweep over the entire surface of the sphere sector defined by movement of said vertical indicator portion, whereby vertical orientation information may be accurately determined from the indicia on the said arcuate scale by rotating the arcuate scale to a position wherein one point of said arcuate scale is immediately adjacent said indicator portion.

3,956,832

WEB DRYER ARRANGEMENT

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Sept. 13, 1974, Ser. No. 505,752
Int. Cl.[2] F26B *11/02*
U.S. Cl. 34—115 4 Claims



1. Apparatus for drying a traveling, permeable web comprising:

at least a pair of support members, each having a foraminous surface and arranged in an upper and a lower tier;

a pair of felt members for supporting the web on either side thereof;

guide means for

a. directing the felts and interposed web onto the surface of a support member whereby one felt member is innermost relative to the support member surface and the other felt member is outermost relative thereto,

b. guiding the outermost felt member away from the web in spaced relationship thereto while the now exposed web and innermost felt remain on the support member surface,

c. returning the outermost felt member to contact the seb so that the web is in supporting contact with both felts,

d. removing the felts and interposed web from the support member surface and conveying them onto the surface of a support member in the other tier,

e. guiding the outermost felt member, which was the innermost felt member relative to the immediately preceding support member surface, away from the web in spaced relationship thereto while the now exposed web and innermost felt member, which was the outermost felt member relative to the immediately preceding support member surface, remain on the support member surface,

f. removing the felts and interposed web from the support member surface in said other tier;

a hot air supply means positioned about the support members' surface in spaced, substantially parallel adjacency to the exposed web on the innermost felt and between the web and outermost felt member to direct hot air onto and through the web and innermost felt member to provide equal exposure of the felts and of both sides of the web thereon to the drying effects of the hot air blowers as they are conveyed from tier to tier;

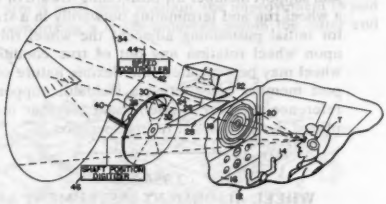
vacuum chamber means mounted beneath the foraminous support members' surface to draw hot air and water vapor through the web and lowermost felt member and maintain the web in stabilized condition while exposed on the lowermost felt above the vacuum chamber means.

3,956,833

VEHICLE SIMULATOR BINOCULAR MULTIPLANAR VISUAL DISPLAY SYSTEM

Wendell D. Chase, Saratoga, Calif., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Sept. 13, 1974, Ser. No. 505,881
Int. Cl.[2] G09B *9/08*
U.S. Cl. 35—12 N 14 Claims



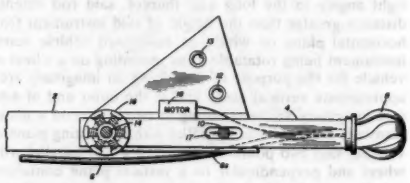
1. In apparatus for simulating movement of a vehicle in an environment wherein there is variation in the range between the vehicle and the environment and wherein the apparatus is of the type that includes an operator's station, a beam splitter, means for projecting a CRT image on the beam splitter that simulates a view of the environment from the vehicle, a fixed optical path visually accessible from the station which passes obliquely through said beam splitter and coincides with the CRT image reflection path from the beam splitter, at least one control manipulable from the operator's station, and means responsive to manipulation of the control for altering the CRT image projected on the beam splitter to simulate relative movement between the vehicle and the environment consequent upon the manipulation, the improvement comprising a plurality of optical image forming elements, each optical image forming element representing a different range between said vehicle and said environment, each element forming a virtual image at a different apparent distance from the beam splitter, means for sequentially interposing said elements in the optical path, means for generating an identifying signal for identifying which of said elements is interposed in the optical path, and means responsive to said identifying means for activating that part of the CRT image that corresponds in range to the optical element interposed in the optical path.

3,956,834

DREDGE LADDER SHOCK MOUNTING ARRANGEMENTS

William Andrew McWatters, c/o P. E. Terry Charlton Road, East Brookfield, Mass. 01515

Continuation-in-part of Ser. No. 471,897, May 21, 1974, which is a division of Ser. No. 195,674, Nov. 4, 1971, Pat. No. 3,821,859. This application July 25, 1974, Ser. No. 491,659
Int. Cl.[2] E02F *3/90*
U.S. Cl. 37—72 18 Claims



1. Dredging apparatus comprising:

a main dredge ladder part and means for pivotally connecting one end of said main dredge ladder part to a dredge platform,

a secondary dredge ladder part having means for accommodating a dredging head,

and ladder part interconnecting means for interconnecting said main dredge ladder part and secondary dredge ladder part together,

said ladder interconnecting means including pivot pin means for pivotally connecting said ladder parts together and shock absorbing means for absorbing shock forces transmitted from said secondary dredge ladder part to said pivot pin means during dredging operations by permitting relative movement of said pivot pin means and at least one of said ladder parts in a direction radially of the pivot axis of said pivot pin means against the restoring force of said shock absorbing means,

wherein said ladder interconnection means further includes locking means for pivotally locking said ladder parts in predetermined adjusted working positions, and wherein said locking means includes means separate from said shock absorbing means for permitting linear movement of said ladder parts with respect to one another while maintaining a substantially fixed angular orientation of said ladder parts with respect to one another.

3,956,835

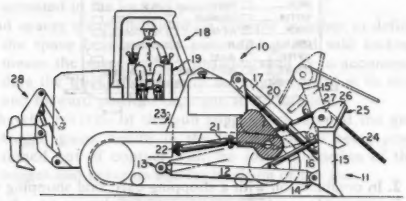
LOG SKIDDER WITH IMPLEMENT MOUNTED CABLE GUIDE MEANS

Robert E. Evenson, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 28, 1975, Ser. No. 563,269

Int. Cl.² E02F 3/76

U.S. Cl. 37—117.5 **11 Claims**



1. A mobile vehicle comprising

winch means including a cable associated therewith, said winch means mounted on an end of said vehicle for selectively paying-out said cable therefrom,

a bulldozer assembly, including a blade disposed adjacent to said winch means at said end of said vehicle, mounted on said vehicle, and

cable guide means including a pulley rotatably mounted directly over and closely adjacent to an upper edge of said blade, said cable guide means receiving and guiding said cable thereover.

3,956,836

ALBUM

Paul E. Seaborn, Los Gatos, Calif., assignor to The Mead Corporation, Dayton, Ohio

Filed Dec. 17, 1974, Ser. No. 533,477

Int. Cl.² G09F 1/06

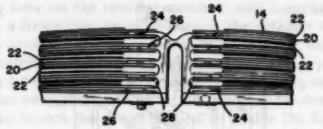
U.S. Cl. 40—102 **10 Claims**

1. An album comprising:

a. a flexible, spine of unitary construction having inner and outer surfaces,

b. a plurality of fingers projecting substantially normally from said spine inner surface in spaced, substantially parallel relationship to each other,

c. said spine being of reduced thickness at areas thereof intermediate said fingers,



d. a plurality of pages,

e. each of said pages having an opening in an edge surface thereof receiving one of said fingers, and

f. means for securing said fingers in said openings.

3,956,837

DISPLAY FRAME

Takeo Itano, 6459 N. Wayne Ave., Chicago, Ill. 60626

Filed Sept. 20, 1974, Ser. No. 507,854

Int. Cl.² G09F 1/12

U.S. Cl. 40—152.1 **9 Claims**

1. A display frame for a photograph, or the like, comprising a front frame member having a forwardly directed base protion and a flat, sheet-like, upwardly directed portion formed of transparent material, a rear frame member having a rearwardly directed base portion and a flat sheet-like, upwardly directed portion, a first guide element secured to the underside of the base portion and extending rearwardly beyond the upwardly directed portion of the front frame member, a second guide element secured to the underside of the base portion and extending forwardly of the upwardly directed portion of the rear frame member, a third guide element secured to the underside of the base portion of the front frame member and being spaced from the first guide element, a fourth guide element secured to the underside of the base portion of the rear frame member and spaced from the second guide element, said first and second guide elements and said third and fourth guide elements making sliding engagement with each other respectively when the front and rear frame members are pushed toward one another so as to hold a photograph between their respective flat, upwardly directed portions.

3,956,838

PICTURE FRAME

Charlene E. Gerrish, Danville, Calif., assignor to Sunset Designs, Inc., Concord, Calif.

Filed June 17, 1974, Ser. No. 479,870

Int. Cl.² G09F 1/12

U.S. Cl. 40—154 **6 Claims**

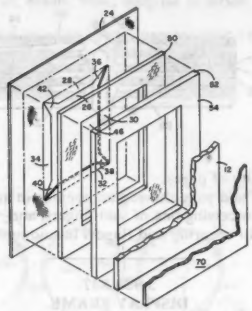
1. The improvement in a frame comprising:

a base member having a relatively stiff conformation with an opening for viewing an artistic rendering therein,

a resilient deformable foam material conforming substantially to the size and shape of said base member and overlaid on the face of said base; and,

a cloth material overlying said foam and wrapped around the interior edges defined by said opening and around said peripheral edges and secured to the underside of said

base in a snug manner by an adhesive adhered to the underside of said base member and between the base



member and the wrapped material overlying the underside thereof.

3,956,839

FRAME AND A DEVICE FOR SECURING DISPLAY PANELS IN SAID FRAME

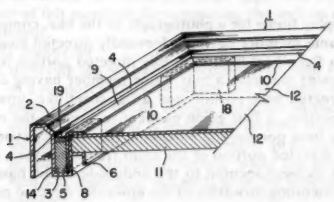
Tsukasa Yoshida, Nikko Danchi 15-202 Nikko-cho No. 1-3, Fucheu, Tokyo, Japan

Continuation of Ser. No. 392,122, Aug. 27, 1973, abandoned. This application Feb. 28, 1975, Ser. No. 554,043

Claims priority, application Japan, Aug. 31, 1972, 47-100975

Int. Cl.² G09F *1/12*

U.S. Cl. 40—156 **2 Claims**



1. A frame for holding display panels is comprised of a plurality of channel-shaped frame members each having front and rear surfaces and an elongated recess in said front surface thereof and an inwardly extending flange for supporting a display panel thereon, a plurality of L-shaped display panel holder members coextensive in length with said recess each having one leg thereof disposed in a respective recess with the other leg thereof extending inwardly in spaced apart overlying relation with respect to said flange to hold and cover the entire peripheral edge of a display panel on said flange, said one leg of said holder member and the opposed wall of said recess having complementary regularly spaced wave-like indentations extending the length of said recess and separate, expandable and removable plug means disposed in each of said recesses to secure said holder members in adjusted locked relation due to inter-engagement of said wave-like portions.

3,956,840

PERFORATED ANIMAL IDENTIFICATION TAG

John E. Melin, 1508 Culberston, Worland, Wyo. 82401

Filed Apr. 15, 1974, Ser. No. 460,824

Int. Cl.² G09F *3/00*

U.S. Cl. 40—301 **1 Claim**

1. A tag for identification of animals comprising a portion for extending through the tissue of the animal and an identification means connected thereto, the improvement which comprises porous ceramic in said portion for extending through the tissue of the animal, siad porous ceramic allowing

for animal tissue growth into said porous ceramic of said portion.

3,956,841

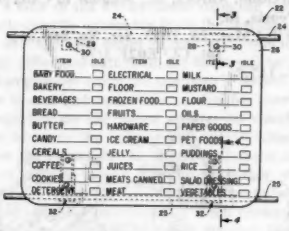
SHOPPING CART DIRECTORY

Ann C. Hensel, 19120 Bessemer St., Reseda, Calif. 91335

Filed June 4, 1975, Ser. No. 583,521

Int. Cl.² B62B *11/00*

U.S. Cl. 40—308 **4 Claims**



2. In combination with a shopping cart, said shopping cart being movable, said shopping cart including a wire basket section formed of a plurality of spaced apart wire rods, a directory for engaging said wire rods and being fixedly mounted upon the shopping cart, said directory comprising:

a directory plate being formed of a rigid material, said directory plate having a front surface and a back surface, said front surface having indicia thereon to facilitate location of a plurality of purchaseable items within a store;

first clamping bracket means attached to said backside of said directory plate, said first clamping bracket means being fixed to said plate and adapted to engage a single one of said wire rods;

second clamping bracket means attached to said back surface of said directory plate, said second clamping bracket means including a first member fixedly attached to said directory plate and a second member being movably mounted upon said first member, said second member to tightly engage another one of said wire rods and remain in a fixed position thereby securing said directory plate to said shopping cart; and

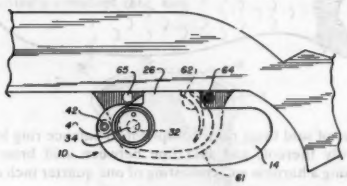
said second member adapted to assume a canted position with respect to said first member when said directory plate is installed upon said shopping cart, said second member including engagement means to slightly penetrate the back surface of said directory plate to thereby fix the position of said second member with respect to said directory plate.

3,956,842

GUN TRIGGER LOCK

Robert J. Ballenger, Highland Park, Ill., assignor to Central Specialties Co., Chicago, Ill.

Filed July 26, 1974, Ser. No. 485,893
Int. Cl.² F41C 27/10
U.S. Cl. 42—1 Y 7 Claims



1. A gun trigger lock for use in conjunction with a gun trigger guard comprising, in combination,

a pair of opposed plates of elongate configuration,

each of said plates provided with pin apertures adjacent one end of said plates,

each of said plates including a block portion upstanding therefrom along one edge of each of said plates to accommodate a safety in the area above the trigger guard to accommodate the forward and rearward position of said gun trigger lock with regard to a trigger,

a pin member received through said pin apertures in said plate and securing said plates together in mutual pivotal relationship,

locking means proportioned to penetrate the space between the two plates and to draw said plates together when actuated in the locking posture,

and spacer means provided on said pin member to define the space between said pin member and said locking means the space being a distance such as to accommodate the thickest portion of the trigger guard at its rear and forward portions on a gun to be safetied,

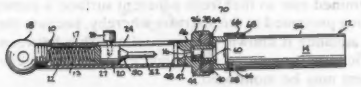
whereby reversal of the gun trigger lock around the gun trigger guard results in the locking means being positioned out of contact with the forward portion of the trigger and prevents accidental firing of the gun.

3,956,843

DUAL RANGE PROJECTILE AND LAUNCHING DEVICE AND DISPOSABLE LAUNCHING TUBE ASSEMBLY THEREFOR

Alan Litman, Pittsburgh, Pa., assignor to Smith & Wesson Chemical Company, Inc., Rock Creek, Ohio

Filed Mar. 13, 1975, Ser. No. 558,042
Int. Cl.² F41C 27/06
U.S. Cl. 42—1 F 6 Claims



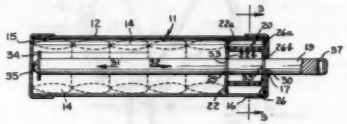
1. A device for launching a projectile comprising a launching tube, a projectile within the tube, a launching handle, a firing pin mounted for axial movement within the launching handle, a spring in the launching handle cooperating with the firing pin for biasing the firing pin in an axial direction along said launching handle, means for compressing the spring and for retaining the firing pin in a ready position under the force of the spring, said launching handle further including a retainer member mounted on one end thereof, said retainer member having a recess therein for receiving the launching tube, a magnet mounted on the retainer member, said launching tube having a ferrous metal member mounted on its base cooperating with said magnet for detachably retaining the launching tube on the retainer member, said launching tube including a firing cap, an axial bore in the retainer member providing access to the firing cap by the firing pin, said firing pin for entering the retainer member recess to eject the launching tube from the handle, said spring having sufficient force under compression to move the firing pin for detonating said cap to launch the projectile and to enable the firing pin to overcome the magnetic force for ejecting the tube from the retainer member and to absorb at least a portion of the launch recoil.

3,956,844

LOADING DEVICE FOR A TUBULAR PROJECTILE

Kenneth W. Misevich, Fairfield, Conn., and Henry G. Tucker, Westfield, Mass., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Sept. 11, 1974, Ser. No. 504,972
Int. Cl.² F41C 27/00
U.S. Cl. 42—90 5 Claims



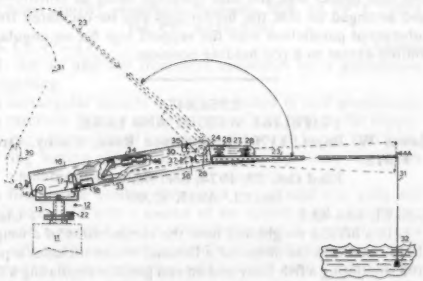
1. A loading device for loading a projectile in a launcher, said loading device comprising a container for holding a projectile, plunger means mounted in the container for motion in one direction and having means for preventing motion of said plunger means in an other direction, stem means slidably mounted in said plunger means for motion therethrough in said other direction, means for limiting motion of said stem means in said other direction at a predetermined position, and means for preventing motion of said stem means through said plunger means in said one direction.

3,956,845

AUTOMATIC FISHING POLE

Max E. Hunnicutt, 9533 Lutheran Way, Santee, Calif. 92071, and William H. Michael, 1306 N. Magnolia, Sp. 37, El Cajon, Calif. 92020

Filed Apr. 1, 1975, Ser. No. 564,045
Int. Cl.² A01K 79/00
U.S. Cl. 43—6.5 6 Claims



1. An automatic fishing pole comprising:

a boom assembly carried at one end thereof by a boat rail and extending outboard therefrom;

a hollow fishing rod assembly rotatably carried by the outboard end of said boom assembly;

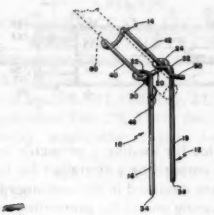
a fishing line passed through the center of said hollow fishing rod and terminating at one end in a lure disposed beneath a water level at one extreme rotative position of said fishing rod;

a hydraulic rotary actuator carried by said boom assembly and coupled to said rod assembly operable for applying rotative force to said rod assembly;

a hydraulic linkage coupled to another end of said fishing line and to a spring-loaded hydraulic valve; and

a hydraulic pump, said spring-loaded hydraulic valve coupled in series between said hydraulic pump and said rotary actuator, said hydraulic linkage being operable for applying hydraulic pressure to said rotary actuator upon a tensioning of said fishing line whereby said fishing pole assembly is rotated in a vertical plane when a fish is hooked, placing said fish on the deck of said boat.

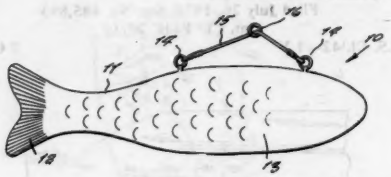
3,956,846
COLLAPSIBLE FISHING
James Eldon Kent, 1828 S. Main, Wichita, Kans. 67213
Filed Feb. 10, 1975, Ser. No. 529,946
Int. Cl.² A01K *97/10*
U.S. Cl. 43—21.2 **10 Claims**



1. A fishing rod holder construction comprising a generally U-shaped support and a generally U-shaped rod holder, said support comprising a pair of elongated and parallelly spaced support legs that are joined by a web extending therebetween, said support being provided with a pair of spaced openings therethrough that are disposed adjacent the junctures of the web with the support legs, said rod holder comprising a pair of generally parallel holder legs that are joined by a holder web, said holder legs having a spacing about the same as that of said pair of openings, said holder legs slidably extending through said pair of openings in an arrangement such that the holder web can be moved from a retracted position relatively adjacent the support web through a range of intermediate positions to an extended position relatively remote therefrom, and said holder legs and said openings being so constructed and arranged so that the holder legs can be oscillated from substantial parallelism with the support legs for an angularly limited extent to a rod holding position.

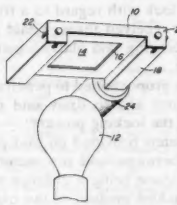
3,956,847
LIFELIKE WEIGHT AND LURE
James W. Bayes, 11701 S. Emerson Road, Canby, Oreg. 97013
Filed Oct. 29, 1974, Ser. No. 518,760
Int. Cl.² A01K *95/00*
U.S. Cl. 43—43.1 **1 Claim**

1. In a lifelike weight and lure, the combination of a weight that is cast into the shape of a fish and which includes a portion simulating a fish body and an end portion simulating a fish tail integral therewith, means whereby said weight is secured to deep lines of a commercial fisherman setup, said means comprising a pair of brass rings in spaced apart relation along a top of said weight body, said brass rings having opposite ends of a short line secured thereto, said short line being passed through a ring secured to said deep lines of said commercial setup, said weight being made of a lead metal, a forward one of said brass rings being over a head portion of said body and



the other of said brass rings comprising a balance ring located rearwardly thereof, and said line between said brass rings comprising a harness and consisting of one quarter inch cable.

3,956,848
INSECT POPULATION SERIALIZER
Donald D. Job, Sudbury, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.
Filed Apr. 3, 1975, Ser. No. 564,964
Int. Cl.² A01M *1/14*
U.S. Cl. 43—115 **6 Claims**



1. An insect population serializer for use in a field environment comprising

a closed housing having an aperture in a lower surface thereof so that the housing shields the aperture from the surrounding environment,

a pair of spaced, parallel spindles journaled in the housing on opposite sides of the aperture,

a non-continuous web of fly paper passing between end rolls suspended on the respective spindles, one of the end rolls being a supply roll and the other being a take-up roll, the web of fly paper having a surface thereon to which insects adhere upon alighting thereon, the opposite surface of the web of fly paper being a nonadherent surface, and

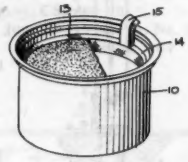
means for remotely and continuously advancing the fly paper from the supply roll to the take-up roll at a predetermined rate so that fresh adherent surface is constantly being presented at the aperture whereby, because the rate of advance is known, the time relationship between specific insects captured and a time varying outside environment may be monitored.

3,956,849
FUMIGANT CONTAINER
Tudor Radulescu, c/o Laboratoire de Chimie et de Biologie, 71 Lenozan, La Salle, France
Filed Aug. 16, 1974, Ser. No. 498,136
Claims priority, application France, Aug. 27, 1973, 73.31007; Feb. 13, 1974, 74.04811
Int. Cl.² A01M *13/00*
U.S. Cl. 43—127 **2 Claims**

1. A hermetically-sealed fumigant container comprising:

A. a non-combustible can having a removable lid,

B. a smoke generating mixture disposed in said can, said mixture having active ingredients constituted by a loose powder having an ammonium nitrate and dicyandiamide base with a silica additive which when heated for a predetermined period of at least one minute initiates an exothermic reaction generating a pesticidal smoke, said silica additive being in an amount which regulates the exothermic reaction to cause said reaction to proceed at a substantially constant rate, and



C. an internal heater disposed in said can formed of an auto-combustible material which when the lid is removed and the material is ignited, produces sufficient heat for said predetermined period to initiate said exothermic reaction, said heater being formed of cellulosic material impregnated with an ignition agent selected from the class consisting of potassium nitrate, sodium nitrate and barium nitrate, said heater being in the shape of a ring surrounding said powder mixture and placed against the internal wall of the can, said ring having a fuse extending therefrom.

3,956,850

KISSING DOLL HAVING SQUEEZABLE ARM AND SOUNDER LOCATED SUBSTANTIALLY MIDWAY BETWEEN ARM AND MOUTH

Robert J. Seidenberg, Oceanside, N.Y., assignor to Eugene Doll & Novelty Co., Inc., New York, N.Y.

Filed Jan. 31, 1975, Ser. No. 546,024
Int. Cl.² A63H *5/00*
U.S. Cl. 46—117 **7 Claims**

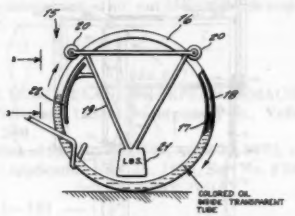
1. A doll comprising a doll head, a torso and an arm, said head having a neck and lips and being formed with an opening between the lips and open to the outside of said head, and said torso having a shoulder, said arm having an upper arm portion, an elbow portion, a forearm portion and a hand portion, said portions being attached to said shoulder and being hollow and constituting a collapsible bulb which may be squeezed and which will expand to normal condition when released, a tube communicating with said bulb, passing through said shoulder, torso and neck into said head, and connecting said bulb with said opening between said lips, and a sounding reed in said tube in position to be sounded only when air flows through said opening into said tube toward said bulb, said bulb, when squeezed, causing air to be flowed out of said bulb and through said tube and opening to the outside air, and said bulb, when allowed to expand, causing air to flow through said opening and tube into said bulb, and simultaneously sound said reed, said reed being located remotely from said bulb substantially midway along said tube, said bulb being wholly closed except for its communication with said tube.

3,956,851

HOOK THE LOOP

William Tapinekis, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed May 1, 1974, Ser. No. 465,729
Int. Cl.² A63H *33/02*
U.S. Cl. 46—220 **3 Claims**



1. A toy comprising a circular loop and a rod, said rod having a handle at one end and a hook at the opposite end for engaging the loop to propel and guide said loop over a surface, said circular loop including a balancing means, said balancing means including a weight supported by rollers on the loop periphery including suspension means for suspending said weight below the top of said loop, said weight being symmetrically aligned with the center of gravity of said loop, whereby the weight will act as a counterbalance to assist in maintaining the loop substantially in a verticle position as it travels over a surface.

3,956,852

AIR AND SOIL TREATMENT APPARATUS FOR A GREENHOUSE

Ion Ceausescu; Petre Constantinescu, both of Bucharest; Emil Oachis, Cluj, and Nicolae Cristea, Bucharest, all of Romania, assignors to Intreprinderea Metalul Rosu Cluj, Cluj, Romania

Filed Feb. 28, 1975, Ser. No. 554,317
Claims priority, application Romania, Mar. 10, 1974, 77879
Int. Cl.² A01G *9/00*
U.S. Cl. 47—17 **3 Claims**

1. An air and soil treatment apparatus for a greenhouse comprising:

a rectangular upright housing disposed in said greenhouse;

a reservoir formed at the bottom of said housing for supplying a ground-level irrigation system with liquid, said housing having side walls defining an upwardly open first chamber formed above said reservoir;

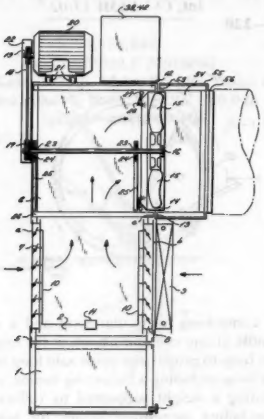
a first intake window formed in one of said side walls and connected with a source of air outside said greenhouse, and a second intake window formed in another of said side walls and opening into said greenhouse;

heating means spanning said second intake window for heating recycled air;

adjustable, selectively operable dampers provided in each of said windows;

said housing being formed with other walls defining a downwardly open second chamber above said first chamber and communicating therewith;

a discharge window formed in one of the walls of said second chamber;
a fan positioned in said discharge window;
a motor mounted on top of said housing externally of said chambers;
means for operably connecting said motor to said fan for driving same;
spraying means in said second chamber upstream of said fan;
a source of water connected to said spraying means and said reservoir and a valve for adjusting the flow thereof;
a source of carbon dioxide gas connected to said spraying means and a valve for adjusting the flow thereof;
a source of nitrogen-containing gas connected to said spraying means and a valve for adjusting the flow thereof;



a source of liquefied fertilizer connected to said spraying means and said reservoir and a valve for adjusting the flow thereof to said spraying means;
a source of liquefied pesticide connected to said spraying means and said reservoir and a valve for adjusting the flow thereof to said spraying means;
said housing forming a third chamber downstream of said fan and said discharge window;
a demister in said third chamber for removing large water droplets from an airstream generated by said fan;
ducts means fo distributing said airstream into said greenhouse; and
means for collecting said water droplets from said demister and feeding the collected droplets to said reservoir.

3,956,853

LOCKABLE AND RELEASABLE PARKING SPACE BARRIER

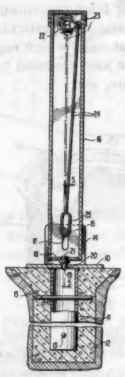
George R. Montgomery, 1152 Okeechobee Road, West Palm Beach, Fla. 33401

Continuation-in-part of Ser. No. 560,334, March 21, 1975, Pat. No. 3,925,929. This application Oct. 15, 1975, Ser. No. 622,526

Int. Cl.[2] E05B *65/00*; **E06B** *11/00*

U.S. Cl. 49—35 **5 Claims**

1. A lockable and releasable parking space barrier comprising a base member adapted to be fixed to a floor or to the ground and having spaced upright elements and a bottom substantially horizontal plate provided with a locking opening between the upright elements, a cross pin secured to and extending between the upright elements at an elevation above the horizontal plate and locking opening, a barrier post engaging between the upright elements and above said horizontal plate and having a pivotal and sliding connection with the cross pin, said barrier post including a lower end wall, a locking pin dependingly secured to said lower end wall and being engageable within said locking opening below the lower end wall, and key operable means on said barrier post above the



cross pin including a movable element having a lost motion connection with the cross pin, whereby in one position of the key operable means said post and locking pin are liftable relative to said horizontal plate to remove the locking pin from the locking opening of the horizontal plate.

3,956,854

APPARATUS FOR PREVENTING THE ACCIDENTAL DETACHMENT OF THE HORIZONTALLY ROLLING SASHES OF A WINDOW OF THE LIKE FROM THE SUPPORTING FRAME

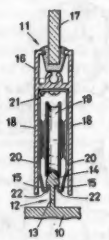
Yukio Yamamoto, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Japan

Filed Dec. 27, 1974, Ser. No. 536,805

Claims priority, application Japan, Dec. 29, 1973, 49-3169[U]

Int. Cl.[2] E05D *13/02*

U.S. Cl. 49—425 **3 Claims**



1. In a sash assembly having rollers that engage a generally horizontal rail to accommodate the movement of the sash therealong, the improvement which comprises in combination at least one overhang ledge extending along said rail; means including walls defining a downwardly opening channel on said sash; said rail extending upwardly into said channel to position said ledge inside the channel and between the walls thereof; a plurality of rollers; a plurality of roller supports each in the shape of an inverted "U" and including a pair of opposed side portions between which a corresponding roller is supported, each roller support being fixedly mounted in a selected position in said channel to hold the corresponding roller in rolling engagement with said rail; and a hook at the end of at least one of said side portions of the roller support,

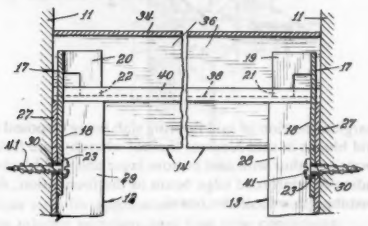
said hook being resiliently deformable to pass over the upper portion of said rail to allow placement of the roller in engagement therewith, and said hook being disposed to normally assume a position underlying said ledge to resist disengagement of the roller from said rail, the deformability of said hook being limited by a corresponding wall of the channel.

3,956,855

DOOR FRAME STRUCTURE WITH SAFETY LOCK BRACKET

Patrick J. Walker, Chicago, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed June 26, 1974, Ser. No. 483,347
Int. Cl.² E06B *1/04*
U.S. Cl. 49—504 **3 Claims**



1. A door frame structure comprising in combination:

1. a pair of spaced-apart channel-form jambs each comprising a major web having a fastener means-receiving aperture therein and adapted to engage a wall, and having a pair of flanges,
2. a channel-form header comprising a major web, depending flanges, and a pair of spaced-apart tracks connected to said depending flanges having its end mounted over the ends of said jambs with the ends of the jambs engaging said spaced-apart tracks,
3. a safety lock bracket mounted at each end of said header comprising a T-form body member having a pair of arms at the upper portion thereof having portions coplanar with said body member, each portion terminating in an elbow connecting to portions extending in the same direction and substantially perpendicular to said body member, the ends of said perpendicular portions terminating in depending track-engaging members engaging and vertically restraining said spaced-apart tracks, and
4. fastening means extending through apertures in said jambs and said brackets and adapted to be driven into said walls.

3,956,856

RECIPROCATING SHARPENER

Edward H. Yonkers, 905 Westerfield Drive, Wilmette, Ill. 60091

Continuation-in-part of Ser. No. 549,963, Feb. 14, 1975. This application Feb. 18, 1975, Ser. No. 550,663
Int. Cl.² B24B *3/54*
U.S. Cl. 51—59 R **40 Claims**

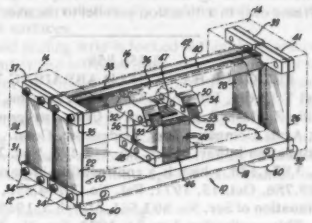
1. A knife edge sharpener comprising

means for simultaneously sharpening first and second spaced apart portions of the same side of the same knife edge, said sharpening means comprising

a first elongated armature including a first work surface moveable along a first reciprocative path for sharpening said first portion of said knife edge,

a second elongated armature including a second work surface moveable along a second reciprocative path for grinding or sharpening said second portion of said knife edge, said first path being parallel to and spaced apart from said second path,

abrasive material affixed to both said first and said second work surfaces and



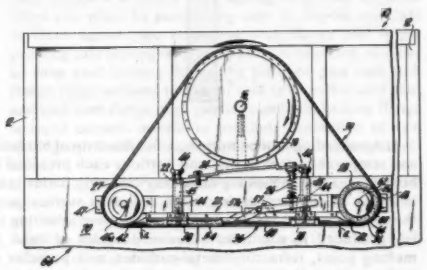
means for moving said first and second armatures and said first and second work surfaces along said first and second paths substantially 180° out-of-phase with respect to each other.

3,956,857

ICE SKATE BLADE SHARPENING MACHINE

Charles Weisman, 125 N. Montgomery St., Valley Stream, N.Y. 11580

Continuation of Ser. No. 352,891, April 20, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,232
Int. Cl.² B24B *21/16*
U.S. Cl. 51—141 **3 Claims**



1. Apparatus for sharpening an ice skate blade or the like, said apparatus comprising the combination of:

a. a support frame;
b. a substantially flat reference surface to which is secured said support frame;
c. a drive motor mounted on said support frame, said drive motor including an output shaft and a drive pulley secured thereto;
d. idler pulley means mounted on said support frame;
e. an endless, flexible abrasive coated belt trained about said drive pulley and said idler pulley means;
f. an elongated, convex platen mounted on said support frame behind said belt;
g. means to cause said belt to conform to the shape of said platen; and
h. means rigidly secured to said support frame and coupled to said platen for limiting the movement of said platen to a plane that is substantially parallel to the plane of said reference surface, said means for limiting the movement of said platen being positioned at a non-changeable predetermined height above the plane of said reference surface whereby said platen is non-movable in a direction perpendicular to the plane of said reference surface, said means for limiting the movement of said platen comprising a pair of studs extending rearwardly therefrom and a pair of tubular members secured to said support frame for receiving said studs, the lontitudinal axes of said tubular

members being at a predetermined dimension with respect to the plane of said reference surface, said tubular members being movable with respect to said support frame only in a direction parellel to the axes of said studs.

3,956,858

FLEXIBLE HAND HELD ABRADING TOOL

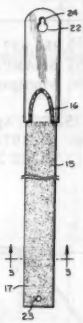
Robert T. Catlin, Trumbull; Chester H. Dawson, Danbury, and Philip R. Haskell, Easton, all of Conn., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Continuation-in-part of Ser. No. 418,498, Nov. 23, 1973, Pat. No. 3,874,126, which is a continuation-in-part of Ser. No. 189,786, Oct. 15, 1971, Pat. No. 3,774,355, which is a continuation of Ser. No. 803,561, March 3, 1969, abandoned. This application Jan. 23, 1975, Ser. No. 543,347

The portion of the term of this patent subsequent to Nov. 27, 1990, has been disclaimed.

Int. Cl.² B24D *15/02*, *11/00*

U.S. Cl. 51—393 **2 Claims**



1. An abrading tool comprising a flexible strip of hardenable and temperable steel having end portions each provided with holder-engaging means for mounting said strip under tension in a saw frame, and having, over at least a surface portion thereof, a strong, tough and adherent abrasive armoring coating produced in situ from abrasive particles of hard, high melting point, refractory metal-carbides, and particles of a high melting and tough brazing metal selected from the group consisting of cobalt-base and nickel-base alloys and combinations thereof, said brazing metal particles being fusion bonded to each other and to said steel strip and alloyed therewith into weldments individual to and partially embedding said abrasive particles, with said abrasive particles projecting from said weldments to form sharp cutting edges, and handle means comprising a sheath of elastomeric material surrounding and self-adhesively removably engaging at least one end portion of said strip to facilitate manual use as a filing device.

3,956,859

FOUNDATION OF A HEATED BUILDING WITHOUT A CELLAR

Irma Ulla Birgitta Ingestrom, Alvangen, Sweden, assignor to A. B. Grona & Company KB, Alvangen, Sweden

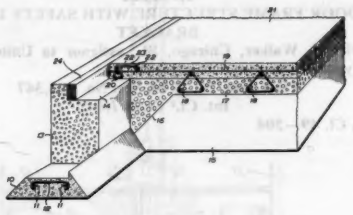
Filed May 6, 1974, Ser. No. 467,531

Claims priority, application Sweden, May 29, 1973, 7307554

Int. Cl.² E02D *27/02*

U.S. Cl. 52—169 R **4 Claims**

1. A foundation of a heated building without a cellar, including prefabricated heat and damp insulating blocks following the contour of the outer walls of the building, a bottom layer made of structural concrete with longitudinal reinforcement bars and extending along the blocks, the blocks being disposed on said bottom layer while said layer is wet, a heat and damp insulating layer of light clinker disposed inside the blocks, an overhead flooring slab made of structural concrete and having a longitudinally reinforced marginal portion, said blocks having their inner edges recessed along their entire length at the top thereof, and said longitudinally reinforced



marginal portion of said flooring slab being disposed on top of said blocks in said recesses thereof whereby said flooring slab forms together with said bottom layer and said blocks a longitudinally reinforced edge beam in the foundation, the blocks forming the web of the beam.

3,956,860

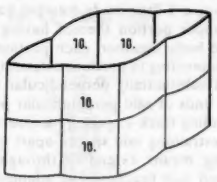
CONSTRUCTION OF CONTAINERS OR TANKS

Reginald Henry Andrews, New Milton, England, assignor to Polycyl (Engineering) Limited, England

Filed May 20, 1974, Ser. No. 471,542

Int. Cl.² L04H *7/30*

U.S. Cl. 52—245 **2 Claims**



1. A container having a peripheral wall constructed from at least one row of interconnectible structural members wherein each of said structural members is of substantially rectangular shape and comprises a panel portion having a shape in cross-section of a circular arc and including a flange extending along the top, bottom and side edges thereof, the top and bottom flanges having the same circular arc shape as said panel and the side flanges each providing two planar faces at an angle to one another, one of said planar faces of each side flange, when viewed in cross-section, extending substantially perpendicular to the chord defined by the end points of the circular arc, the side flanges of adjacent structural members being interconnected in end-to-end relationship in a row to provide a said peripheral wall and at least two of said structural members being arranged in end-to-end relationship so that the said one planar face of one side flange of one structural member abuts with the said one planar face of one side flange of the other structural member so as to produce a scalloped configuration in cross-section.

3,956,861

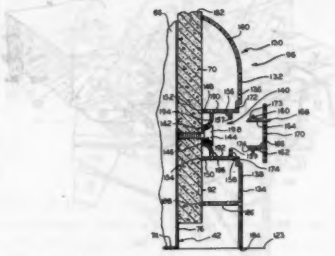
TRIM ARRANGEMENT FOR INTERIOR PARTITIONS

Robert R. Rasmussen, 1120 Grandview Lane, Lake Forest, Ill. 60045

Continuation-in-part of Ser. No. 337,598, March 2, 1973, Pat. No. 3,861,103. This application Sept. 23, 1974, Ser. No. 508,440

Int. Cl.[2] E04B 2/74

U.S. Cl. 52—287 11 Claims



1. A trim strip for application to a vertical wall surface of a building interior partition, said trim strip comprising:

an elongate trim member of generally planar configuration and porportioned to be disposed flush against the partition wall surface,

said trim member having a forwardly facing side facing away from the wall surface when said member is applied thereto and a rearwardly facing side that faces the wall surface when said member is applied thereto,

said trim member defining a centrally located anchoring wall disposed between upper and lower trim walls disposed one on either side of said anchoring wall,

said walls extending longitudinally of said trim member,

said trim walls adjacent said anchoring wall defining generally coplanar trim surfaces that parallel the plane of said member and are located on the outward facing side of said member,

said anchoring wall being offset inwardly of the trim member relative to said trim walls to be disposed on the rearwardly facing side of said member,

said anchoring wall being generally planar and defining a planar seating surface on the rearwardly facing side thereof adapted to seat against the partition wall surface and which substantially parallels the plane of said member,

said trim member along said anchoring wall defining an outwardly opening slot exposing said anchoring wall for applying through same fastener means to secure said trim member to the partition with said anchoring wall seating surface flush against the partition wall surface,

said trim member on said rearwardly facing side including a pair of brace flanges extending normally of the plane of and rearwardly of said trim member and disposed one on either side of and extending in spaced parallel relation to said anchoring wall,

said brace flanges having their rearwardly extending marginal edges disposed in the plane of said anchoring wall seatng surface,

said anchoring wall being broad in the plane of said trim member as compared to said brace flanges for random application of fastener means thereto to secure said member to the partition,

and a sealing strip proportioned to be closely received in said slot for masking said anchoring wall and fastener means,

said sealing strip defining an outwardly facing generally planar front surface,

said trim member and said strip including means for snap fit locking of said strip within said member slot with said strip being recessed within said slot with said surface thereof being in substantially coplanar relation with said trim wall surfaces,

whereby said sealing strip is locked within the plane of said trim member and is free of protrusion outwardly of same,

said member on either side of said slot being indented to define on either side of said slot in parallelism thereto planar surfaces paralleling said trim walls,

said sealing strip defining a masking wall formed with side edges coextensive with same proportioned to seat in said trim member indentations against said planar surfaes thereof,

said locking means comprising:

said trim member being formed to define along said slot a pair of opposed, spaced apart, projecting stub flanges that are in coplanar relation with said trim member and have squared edge portions that oppose each other,

said stub flanges extending lengthwise of said slot and being spaced forwardly of said anchoring wall,

said sealing strip including a pair of spaced apart locking flanges projecting from the rearwardly facing side of same and each including a laterally projecting lug portion adapted to be received behind the respective trim member stub flange edge portions when said sealing strip is received in said slot,

said locking flange lug portions each being formed with a cam surface for camming engagement with the respective stub flanges and said locking flanges defining internal squared corners that receive the respective stub flange edge portions whereby said sealing strip may be press fitted into place by positioning same to dispose said cam surfaces against the respective stub flange and finger pressing said sealing strip rearwardly of said trim member to snap said locking flange lug portions past said stub flange edge portions to mount said strip within said slot, and said stub flange edge portions and said locking flange squared corners interfit to preclude separation of said sealing strip from said trim member due to building movement,

said stub flanges and said sealing strip flanges being located relative to said trim member trim suffaces and said sealing strip front surface to space said locking means and said stub flanges from said anchoring wall in the asembled relation of said anchoring wall.

3,956,862

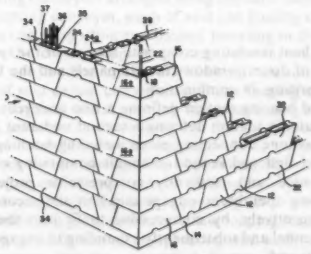
BUILDING SYSTEM

Joao Alexandre, Jr., 30 Jamaica Way, No. 2, Boston, Mass. 02130

Continuation of Ser. No. 458,198, April 5, 1974, abandoned. This application May 27, 1975, Ser. No. 581,312

Int. Cl.[2] E04B 1/00, E04C 1/10

U.S. Cl. 52—286 4 Claims



1. A building system comprised of a number of identical preformed basic building units, each said building unit com-

prising a rigid block having a first pair of parallel horizontal walls, a second pair of parallel vertical walls and a third pair of walls, said third wall pair being oriented obliquely with respect to at least one of the other two wall pairs, means defining a single key having a generally triangular cross section in one of said oblique walls and means defining a matching keyway in the other of said oblique walls, said key and keyway extending along the longitudinal center lines of the oblique walls and occupying substantially the entire oblique walls, means defining a second key in one wall of said horizontal wall pair and means defining a second matching horizontal keyway in the other wall of said horizontal wall pair, said second key and keyway each including a first generally wedged-shaped portion which extends only partway along the longitudinal center line of its corresponding wall but across substantially its entire width and a second generally semicylindrical portion which is oriented perpendicular to the first portion and extends from the block center line to the opposite vertical walls of the block so that a number of said blocks can be stacked side-by-side and in courses with the adjacent blocks in each course being inverted relative to one another so as to interlock with one another to form a rigid, load-bearing structural unit.

3,956,863

HEAT INSULATING COMPOSITE SECTION FOR WINDOW AND DOOR FRAMES AND SIMILAR ITEMS

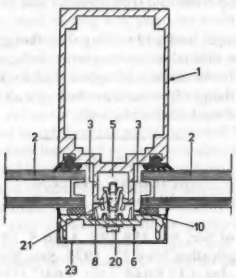
Heinrich Tiedeken, Gottmadingen, Germany, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Feb. 3, 1975, Ser. No. 546,804

Claims priority, application Germany, Feb. 5, 1974, 7403844[U]

Int. Cl.² E04B *2/88*; E06B *1/04*

U.S. Cl. 52—399 **11 Claims**



1. A heat insulating composite section of the type used for frames of doors, windows facade panels and the like,

comprising, in combination,

a load bearing section defining a first undercut channel;

a retaining section defining a second undercut channel;

at least one connecting piece including latching means for said first and second channels comprising normally expanded and resiliently compressable projections and being operable to engage said first and second channels, respectively, by compressing to fit into the respective channel and subsequently expanding to engage the undercut; and

wedge means, including a wedge, secured to one of said sections and operable to block the compression movement of the latching means engaged in the other section.

3,956,864

COMPOSITE STRUCTURAL ASSEMBLY

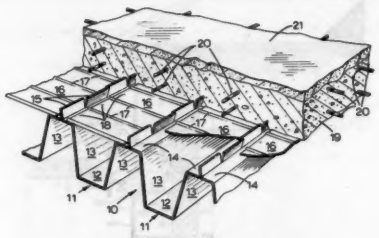
Ching Fung, Willowdale, Canada, assignor to Westeel-Rosco Limited, Toronto, Canada

Filed Feb. 24, 1975, Ser. No. 552,566

Claims priority, application Canada, Dec. 30, 1974, 217139

Int. Cl.² E04B *1/18*

U.S. Cl. 52—414 **12 Claims**



1. A composite structural assembly comprising a plurality of support members disposed in side-by-side relationship, and a layer of cementitious material disposed on the plurality of support members, wherein the plurality of support members have side edge portions each of which presents spaced, projecting lugs, with the lugs presented by one of adjacent side edge portions of adjacent support members alternating in interfitted relationship with the lugs presented by the other of said adjacent side edge portions of said adjacent support members, and with the lugs being embedded within the layer of cementitious material.

3,956,865

METHOD AND APPARATUS FOR PRODUCING A CONTAINER

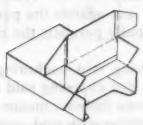
Alfred Schmermund, 62 Kornerstrasse, 5820 Gevelsberg, Germany

Filed Aug. 8, 1974, Ser. No. 495,741

Claims priority, application United Kingdom, Sept. 5, 1973, 41744/73

Int. Cl.² B65B *19/20*, *43/10*

U.S. Cl. 53—29 **19 Claims**



1. A method of producing a container from a foldable container blank having a fold line at the boundary between a first longitudinal portion of said blank and a second longitudinal portion of said blank, the method comprising:

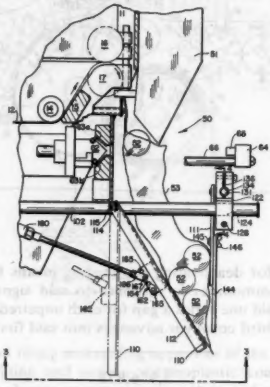
a. the initial step of folding said blank at said fold line to bring mutually adjacent surface portions of said first portion and of said second portion respectively into mutually facing relationship; and

b. the step of gripping said mutually adjacent surface portions in said mutually facing relationship whilst carrying out the further steps subsequent to initial step of folding said first portion to form exclusively from said first portion a main body of said container, and folding said second portion to form a lid of said container while said lid remains hingedly connected with said main body at said fold line.

3,956,866
PACKAGING METHOD AND APPARATUS

Vincent Lattur, Cuyahoga Falls, Ohio, assignor to Automated Packaging Systems, Inc., Cleveland, Ohio

Filed June 28, 1974, Ser. No. 484,275
Int. Cl.² B65B *1/06*
U.S. Cl. 53—29 **21 Claims**



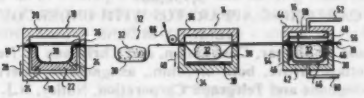
1. A packaging apparatus comprising:
a. structure for feeding a packaging web along a path and for positioning a container on the web in a loading station;
b. support means positioned near said loading station for receiving lower portions of such positioned container;
c. said support means including a pair of relatively movable members movable between first and second positions, said members in the first position converging downwardly toward each other into engagement with opposite sides of lower portions of such engagement with opposite sides of lower portions of such container at locations laterally offset from said path whereby to shift a container to be loaded out of said path and cause the opposite sides of the container to be in substantial registry when the container is loaded, said members in said second position being spaced apart sufficiently to permit movement of the loaded container back from the offset position and the passage of such loaded container between the members; and,
d. means for effecting relative movement of said members between said first and second positions.

3,956,867
METHOD OF PRODUCING A PACKAGE

Kastulus Utz, Freising; Josef Hartmut Esterhammer, Wasserburg, and Arthur Vetter, Gronenbach, all of Germany, assignors to Multivac Sepp Haggenmueller KG, Wolfertschwenden and Alkor-Werk Karl Lissmann KG, Munich, both of, Germany, part interest to each

Filed Dec. 23, 1974, Ser. No. 535,866
Claims priority, application Germany, Dec. 24, 1973, 2364565
Int. Cl.² B65B *31/02*
U.S. Cl. 53—22 A **10 Claims**

1. A method of producing a package without wrinkles by applying a vacuum forming operation and a heat shrinking operation comprising:
a. forming a pouch in a first foil and thereby stretching the material;
b. putting the commodity to be packed into the pouch;
c. advancing a second foil to the first foil;
d. sealing the package in an evacuated space;
e. heating the first foil in the area of the pouch prior to or at the same time as; and

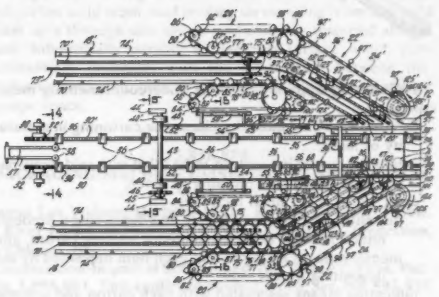


f. aerating the evacuated space at the same time or subsequent said step of heating the first foil in the area of said pouch and subsequent said sealing of said package.

3,956,868
CARTON OPENING, FILLING AND CLOSING APPARATUS

Robert H. Ganz, Saddle River; John H. Myers, Bergenfield, and Edward A. Waleck, Closter, all of N.J., assignors to Federal Paper Board Company, Inc., Montvale, N.J.

Filed Nov. 6, 1974, Ser. No. 521,247
Int. Cl.² B65B *5/10, 35/44, 43/26*
U.S. Cl. 53—48 **18 Claims**



2. A packaging machine for opening and loading collapsed tubular cartons which are adapted for packaging canned products, or the like, said cartons being of the type which have end closure panels hinged to opposite ends of oppositely disposed side wall forming panels, said packaging machine comprising a carton supporting conveyor having a run thereof disposed for travel in a generally horizontal path, means for depositing successive collapsed cartons on said conveyor run, means along said carton carrying conveyor run for opening up each said carton into tubular shape with the carton supported on said conveyor so that oppositely disposed ends open in a direction outboard of the sides of the path of the carton conveyor, means for driving said carton supporting conveyor so as to advance the cartons to a loading station, endless traveling can feeding conveyors arranged along opposite sides of the carton supporting conveyor, each of said can feeding conveyors having a can supporting run thereof traveling in the same direction as the carton supporting conveyor run, means for driving said can feeding conveyors in timed relation to the movement of said carton conveyor, said can feeding conveyors each having said can supporting run terminating short of said loading station with the leading end thereof spaced longitudinally and laterally from said loading station, endless traveling conveyor means having a can supporting run extending from the leading end of each said can feeding conveyor to said loading station and having can supporting and advancing means for delivering groups of cans to said loading station and continuously traveling means co-operating with each said can feeding conveyor and the associated diagonally extending conveyor group supporting and advancing means at the leading end of said can feeding conveyor for segregating groups of the cans and advancing the groups of cans in predetermined

spaced relation to said loading station for delivery into the ends of a carton advanced to said loading station.

3,956,869

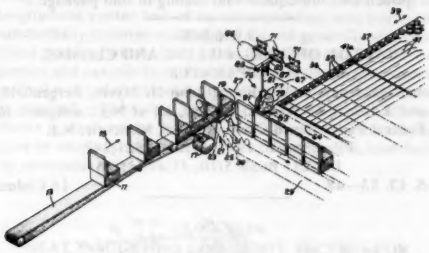
CARTONING APPARATUS WITH UNDERCOUNT MEMORY MEANS

Donald A. Slathar, Chanhassen, and Christiaan H. Neutkens, Cottage Grove, both of Minn., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Apr. 14, 1975, Ser. No. 567,905

Int. Cl.² B65B *57/10*

U.S. Cl. 53—53 **20 Claims**



1. Cartoning apparatus with an undercount memory means comprising:

means for feeding individual items for cartoning in a plurality of lanes;

means for conveying cartons to be filled with said items past the terminal of said plurality of lanes;

each said lane terminal including

depositing means for engaging and depositing a predetermined number of items into each passing carton, and

memory means responsive to each item deposited by said depositing means; and

indicating means associated with each carton and actuated by a memory means whenever an undercount in the predetermined number occurs.

3,956,870

MACHINE FOR PACKING CIGARETTES OR THE LIKE

Friedel Kruse, Hamburg; Günter Wahle, Reinbek; Otto Erdmann, Hamburg, and Willy Rudszinat, Dassendorf, all of Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg, Germany

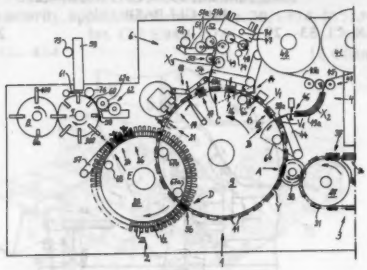
Filed Dec. 4, 1974, Ser. No. 529,485

Claims priority, application Germany, Dec. 17, 1973, 2362771

Int. Cl.² B65B *11/32*, *57/06*

U.S. Cl. 53—55 **16 Claims**

1. In a machine for transporting and manipulating commodities, particularly in a packing machine for cigarettes or analogous rod-shaped articles, a combination comprising a first conveyor defining a first path; a second conveyor defining a second path; first means for feeding a first series of first commodities into a first portion of said first path so that said first conveyor advances the commodities of said first series along said first path; second means for feeding a second series of second commodities into a second portion of said first path so that each commodity of said second series is normally paired and advances with a commodity of said first series; means for transferring successive pairs of first and second commodities from a third portion of said first path into said second path so that said second conveyor advances the thus transferred pairs along said second path; means for monitoring said first path between said second and third portions of said first path, including detector means arranged to produce signals in response to detection of unpaired commodities of one of said series; means for deactivating said transferring means in response to said signals so that said unpaired commodities are not transferred into said second path; a third conveyor defining a third path along which said unpaired commodities of said one series advance to said second portion of said first path;



and means for deactivating the feeding means for said one series of commodities in response to said signals so as to provide in said one series a gap for each unpaired commodity which said third conveyor advances into said first path.

3,956,871

CONTAINER BRANDING APPARATUS

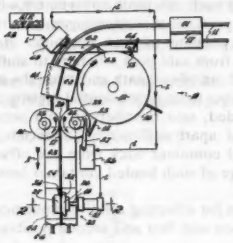
John A. Johnson, New Richmond, Ohio, assignor to Cedar Sales Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 405,909, Oct. 12, 1973, Pat. No. 3,872,646. This application Nov. 21, 1974, Ser. No. 525,978

The portion of the term of this patent subsequent to Mar. 25, 1992, has been disclaimed.

Int. Cl.² B65B *61/02*, *57/08*

U.S. Cl. 53—67 **62 Claims**



25. In apparatus for filling and sealing tubular milk cartons having gable top end closures terminating in a top rib which includes a plurality of panels disposed in adjacent parallel planes, said apparatus being of the type having a carton conveyor and two rollers forming a rotating, rib engaging, nip means for engaging opposite sides of said rib after said cartons have been filled and sealed, dating apparatus for applying branded indicia to at least one of said panels after rib engagement by said nip means, said dating apparatus including:

an anvil,

a dater block including indicia applying means, said anvil and dater block being disposed on opposite sides of at least a portion of a carton,

control means associated with and connected to one of said rollers, and

drive means controlled by said control means in direct response to rotation of one of said rollers for moving one of said anvil and said dater block relatively toward and away from the other to apply said indicia to a carton in response to rotation of said roller.

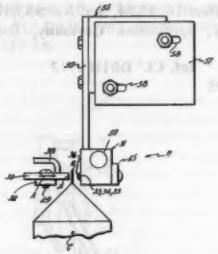
3,956,872
CARTON BRANDING APPARATUS

John A. Johnson, New Richmond, Ohio, assignor to Cedar Sales Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 405,909, Oct. 12, 1973, Pat. No. 3,872,646. This application Dec. 7, 1973, Ser. No. 422,886 The portion of the term of this patent subsequent to Mar. 25, 1992, has been disclaimed.

Int. Cl.² B65B *61/02*

U.S. Cl. 53—131 **13 Claims**



1. In carton filling and sealing apparatus of the type having means for filling and sealing thermoplastic coated cartons having a top closure terminating in a rib including a plurality of parallel adjacent carton panels, said means for sealing cartons including a compression station having an upstream set of sealer jaws and a downstream set of sealer jaws, each set comprising two sealer jaws, one of which is movable toward and away from the other for pressing said panels together after said panels and the thermoplastic thereon have been heated, in order to allow said thermoplastic to set and seal said panels together, dating apparatus spaced from said two sets of sealer jaws for applying date indicia to the ribs of cartons downstream from said compression station, said dating apparatus comprising:

an anvil means connected to the movable jaw of said downstream set of jaws, and

dater block means spaced from and aligned with said anvil means, said dater block means including protruding date indicia applying means aligned with said anvil means for applying dates to a carton rib between said anvil means and said dater block means when the movable jaw to which said anvil means is connected is moved toward the other jaw of said downstream set to compress another upstream carton rib, thereby moving the anvil toward said dater block and said date indicia means

said dater block means including means for heating said date indicia applying means so that date indicia is branded into the carton rib.

3,956,873
BANDEROLLING APPARATUS

Josef Kiener, and Eugen Lutz, both of Muhlbachstrasse 12, 8942 Ottobeuren, Germany

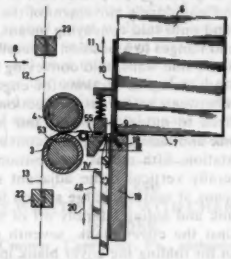
Filed June 17, 1974, Ser. No. 480,223

Claims priority, application Germany, June 20, 1973, 2331400

Int. Cl.² B65B *13/04*, *51/32*

U.S. Cl. 53—198 R **3 Claims**

1. Apparatus for the banderolling of a plurality of objects, comprising means for supporting said objects as a unit, means for supplying banding material to said unit, means for supplying banding material to said unit and wrapping it in a loop around the latter, clamp means for holding the banding material at the neck of said loop, and a device for forming a weld seam between opposed areas of the banding material at the said neck, characterised by the improvement wherein said clamp means comprises four clamps arranged as two spaced apart pairs of clamping jaws, one of each pair being movable and the other immobile, said pairs of jaws defining a narrow space therebetween, said welding device arranged and movable in said space between said immobile jaws of the two pairs into and out of welding contact with said banding material, at least one of said immobile jaws including a plurality of parallel air channels therein communicating with a source of cooling



air to provide cooling air from said source through said channels to the weld seam, said cooling air escaping from said weld seam area through said space, said channels disposed along a path substantially parallel a clamping surface which path substantially coincides with the intersection between the clamping surface of said one of said immobile jaws and said air escape space.

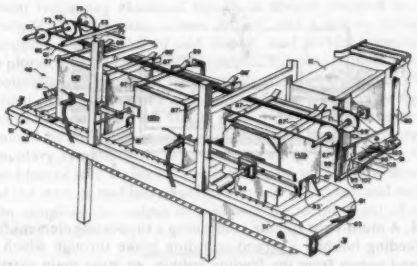
3,956,874
PACKAGING MACHINE USING TWO-BLANK CARTON SYSTEM

James Lee Vickers, Harbert, Mich., and Edmund A. Waycie, River Forest, Ill., assignors to Stone Container Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 480,160, June 17, 1974, Pat. No. 3,896,601. This application July 3, 1975, Ser. No. 592,927

Int. Cl.² B65B *11/18*

U.S. Cl. 53—207 **13 Claims**



1.. A machine for forming a sealed package containing lading from a generally rectangular body blank of paperboard material and a generally rectangular cover blank of a flexible paper or paper-like material, the body blank including a center panel, alternate, hingedly connected side panels and flanges hingedly connected along the longitudinal edges of the center and side panels and along the ends of the side panels, and the cover blank including a center panel and alternate hingedly connected side panels, said machine comprising, first means for positioning the body blank in a generally vertical plane adjcent the outlet of a lading moving station from which a quantity of lading is moved horizontally in one direction, conveying means positioned for horizontal movement in a direction laterally of said one direction, said conveying means including a receiving station adjacent said lading moving station and a discharge station spaced downstream from said

receiving station, second means at said receiving station for folding the body blank into a generally U-shaped formation partially surrounding a quantity of lading with the center panel forming an end wall and the side panels forming two side walls of the formation as the quantity of lading is moved from the lading moving station, engages the body blank and moves onto said conveying means, third means at said receiving station for folding the flanges along each longitudinal edge of the body blank to positions generally perpendicular to the associated side walls and end wall during movement of the lading against the body blank and onto said conveying means, fourth means for folding the end flanges to a position generally perpendicular to the associated side walls, said conveying means including top and bottom transport sections for engaging a folded body blank therebetween, said transport sections being operatively synchronized to move in unison and jointly index a folded body blank and lading along said conveying means to said discharge station, fifth means for positioning the cover blank in a generally vertical plane adjacent said discharge station, sixth means at said discharge station for moving the folded body blank and lading laterally off of said conveying means and against the cover blank, seventh means at said discharge station for folding the cover blank into a U-shaped formation partially surrounding the lading with the margin of the cover blank positioned overlying the flanges of the folded body blank as the folded body blank formation is moved off of said conveying means, and eighth means adjacent said discharge station for retaining the flanges of the body blank in folded-over position until the same are engaged by the adjacent facing margin of the cover blank.

3,956,875

MULTI-TWIST SPINDLE

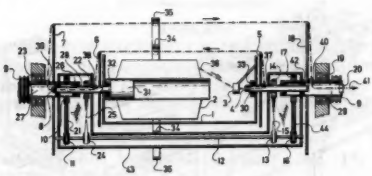
Ferdinand Lenorak, Bratislava, Czechoslovakia, assignor to Slovenska vedecko-technicka spolocnost Dom techniky, Bratislava, Czechoslovakia

Filed June 11, 1974, Ser. No. 478,287

Claims priority, application Czechoslovakia, June 27, 1973, 4612-73

Int. Cl.² D01H 7/86

U.S. Cl. 57—58.61 **3 Claims**



1. A multi-twist spindle comprising a supporting element for a feeding bobbin, a strand-retarding brake through which a strand passes from the feeding bobbin, an inner main carrier and an inner auxiliary carrier axially aligned therewith and spaced therefrom, an inner main pulley and inner auxiliary pulley driving the respective carriers, a main inner transmission means synchronizing the speed and phase of rotation of said inner carriers, said main inner transmission means including a transmission shaft, an outer main carrier and an outer auxiliary carrier, an outer main pulley and an outer auxiliary pulley, a main outer transmission means synchronizing the speed and phase of rotation of the outer main pulley and the outer auxiliary pulley, the main outer transmission means including said transmission shaft, and a central drive means including drive pulleys, the strand proceeding from the brake through the inner twisting couple composed of the inner main and auxiliary carriers and then through the outer twisting couple composed of the outer main and auxiliary carriers, the main inner transmission means and the main outer transmission means including means for driving the inner and outer twisting couples in opposite directions.

3,956,876

APPARATUS FOR SUPPLYING ORIENTED FIBERS TO A SPINNING ROTOR INNER WALL IN AN OPEN-END SPINNING DEVICE

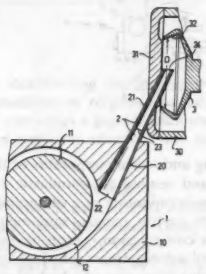
Peter Artzt, Reutlingen; Albert Bausch, Melchingen, and Gerhard Egbers, Eningen, all of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany

Filed Dec. 16, 1974, Ser. No. 533,140

Claims priority, application Germany, Dec. 22, 1973, 2364261

Int. Cl.² D01H 1/12

U.S. Cl. 57—58.95 **3 Claims**



1. Fiber feed apparatus for an open-end spinning device including a spinning rotor having a subpressure within it and a feed tube directed toward and substantially tangentially of the spinning rotor inner wall and having a frustoconical first section including an infeed orifice at the larger section end and a cylindrical second section joined directly to the smaller end of the first section, the second section having an outfeed orifice at its end remote from the first section, the improvement comprising the infeed orifice of the first section having a diameter in the range of 4 to 20 times as great as the diameter of the second section, the second section having a diameter in the range of one-tenth to one-twenty-fifth of the composite length of the first and second sections, and the second section having a length in the range of one-half to three times the length of the first section.

3,956,877

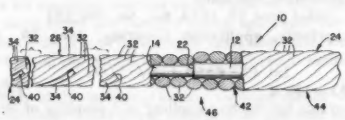
SPLICELESS CABLE AND METHOD OF FORMING SAME

William John Gilmore, Manitou Beach, Mich., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed Apr. 2, 1975, Ser. No. 564,493

Int. Cl.² D07B 1/06

U.S. Cl. 57—145 **17 Claims**



11. A spliceless tapered strand structure comprising:

a. a first core wire segment having a first diameter;

b. a second core wire segment having a second diameter which is less than the first diameter,

1. said second core wire segment being butt welded at a first joint to the first core wire segment;

c. a first outer layer segment, comprising at least one strand wire stranded about the first core wire segment; and

d. second strand wires butt welded at strand joints to each of the first strand wires and being stranded about the second core wire segment as a second outer layer segment to form a continuously tapered strand structure.

3,956,878

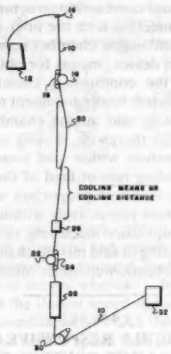
HIGH SPEED TEXTURING

Peter Schaffer, and Geoffrey R. Scantlebury, both of Charlotte, N.C., assignors to Fiber Industries, Inc., Charlotte, N.C.

Filed Sept. 10, 1974, Ser. No. 504,481

Int. Cl.² D02G *1/02*; D01H *7/92*, *13/28*

U.S. Cl. 57—157 TS **14 Claims**



1. In a process for producing a false twist crimped polyester multifilament yarn wherein a partially oriented polyester yarn is fed into a simultaneous drawing and false twist crimping zone consisting of a heated zone and false twister positioned between feed means and draw roll means and wherein the false twist backs upstream into the heated zone wherein the false twist is set into the yarn and wherein the yarn is drawn in a draw zone within the heated zone, the improvements comprising feeding said yarn at a speed as measured at the draw roll means of more than 850 feet per minute, said feed yarn bei;ng partially oriented, having a birefringence of at least 0.020, a crystallinity of not more than 40 percent and a break elongation of 50 to 200 percent, twisting said yarn 40 to 200 twists per inch, heating and drawing the twisted yarn 1.1 to 2.5 times the fed length at a temperature of at least 180° centigrade to just below the melting point of said yarn and untwisting said yarn prior to take-up.

3,956,879

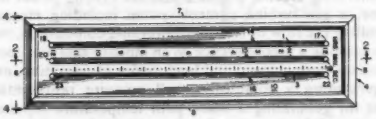
TIME INDICATING DEVICE

James R. Bailey, 4020 N. Pioneer Ave., Chicago, Ill. 60634

Filed Feb. 11, 1974, Ser. No. 441,325

Int. Cl.² G04B *45/00*, *19/24*; G04C *3/00*; G04B *19/02*

U.S. Cl. 58—2 **6 Claims**



1. A time indicating device comprising an endless indicating belt which carries non-digital indicating means thereon that define three or more equally spaced segments of said belt, means comprising a face plate with an elongated opening therein mounted adjacent said belt with said opening in superposed relationship to said non-digital indicating means so that from time to time said indicating means carried by said belt beneath said opening are visible through said opening as said belt is moved past said opening, said face plate carrying time period indicia on the top thereof adjacent said opening, the length of said opening substantially corresponding to the length of one of said segments and said non-digital indicating means being spaced apart a distance corresponding to the length of said opening so that when said belt is moved past said opening there will be a moment when one of said segments will appear over the entire length of said opening with two consecutive said non-digital indicating means appearing, one at each end of said opening, and means for moving said belt containing said non-digital indicating means past said opening.

3,956,880

SOLID STATE WRISTWATCH WITH CHARGE COUPLED DIVIDER

Arthur H. O'Connor, Lancaster, Pa., assignor to Time Computer, Inc., Lancaster, Pa.

Filed Oct. 18, 1973, Ser. No. 407,583

Int. Cl.² G04C *3/00*; G04B *19/30*; H03K *21/02*; H03F *3/02*

U.S. Cl. 58—23 B **10 Claims**

1. A wristwatch comprising a source of substantially constant frequency electrical signals, a divider coupled to the output of said source, a time display, and a display actuator coupling said divider to said display, said divider comprising a plurality of stages of charge coupled transistors, clock means coupling said source of substantially constant frequency electrical signals to each of said stages for causing a charge signal to propagate along the stages of said divider at a rate determined by the frequency of said electrical source, a complementary symmetry MOS inverter coupled between the first and last of said stages for feeding a signal which is the inverse of the state of said last stage back to said first stage, and means for coupling the output of said inverter to the input of said display actuator.

3,956,881

HAIRSPRING AND COLLET ASSEMBLY FOR TIMEPIECES

Pierre-Alain Vuille, Tramelan; Eric Favre, Grenchen, and Friedrich Perrot, Lengnau, all of Switzerland, assignors to ETA A.G. Ebauches-Fabrik, Switzerland

Filed June 16, 1975, Ser. No. 587,054

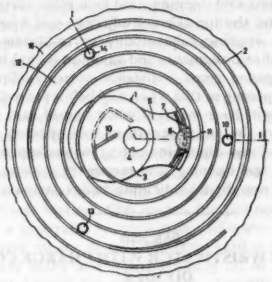
Claims priority, application Switzerland, June 25, 1974, 8714/74

Int. Cl.² G04B *17/32*

U.S. Cl. 58—115 **13 Claims**

1. A hairspring and collet assembly for timepieces in which said collet is composed of a base having an opening adapted for engagement on a balance-staff and of a stud integral with said base and projecting from a face of said base in a direction parallel to the axis of said opening, wherein said hairspring

comprises an inner turn ending in a bend, said stud occupies a portion of the surface of said base extending between said opening and the periphery of said base and comprises a lateral surface for receiving said hairspring, and said assembly com-



prises fixing means for securing a non-deformed portion of said inner turn to said lateral surface, the end of said inner turn and said bend extending freely away from said stud about said opening.

3,956,882

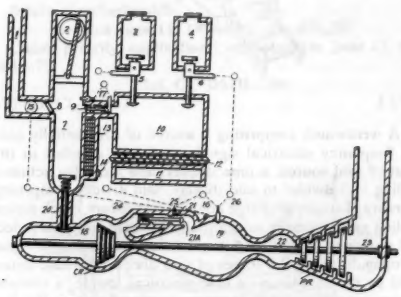
CONVERTIBLE HYDROGENATOR AND GAS TURBINE

Gustave A. Manzato, and Camille B. Manzato, both of 28 Mountain Ave., Rockaway, N.J. 07866

Filed Jan. 28, 1975, Ser. No. 540,137

Int. Cl.² F02B *43/10;* **F02C** *3/20*

U.S. Cl. 60—39.12 **3 Claims**



1. A hydrogen motor device comprising in combination hydrogen-reactant-fuel channeling means for channeling contained hydrogen-producing reactant to a feed point thereof; second fuel-reactant channeling means for channeling contained hydrogen-replacing reactant, reactive with hydrogen producing reactant to produce hydrogen gas, to a feed point therefore; mixing chamber means including a substantially enclosed reaction vessel structure having a first inlet port and the valve means therefor for feeding the contained hydrogen-producing reactant from its feed point into an enclosure space defined within the reaction vessel structure and a second inlet port and second valve means therefor for feeding the contained hydrogen replacing reactant from its feed point into the enclosure space, said reaction vessel structure further having an outlet port located for channeling hydrogen gas from said enclosure space and outlet valve means for controlling flow of hydrogen through said outlet port; gas mixing chamber means defining a mixing chamber for gases and including a gas compression structure, an oxidizing reactant-gas inlet port and one-way inlet valve means therefor and rate-of-feed gas control valve means mounted operatively in series with one-way inlet valve means in flow communication with said oxidizing reactant-gas inlet port, and a gas mixing chamber outlet port and third valve means therefor for controlling outlet flow of mixing gases under compression from the mixing chamber for gases; a compression chamber having drive impeller means mounted within means therefor for supplementing the compression of gases and means for channeling the compressed gas through a pressure valve placed in an inlet port into a combustion chamber means defining two serially connected chamber structures having a first opening in flow communication with the compression chamber and a controlled inlet port preventing the gas of the explosion from flowing upstream, the expanded, heated gas from said communicating combustion chamber means flowing outwardly through a second chamber outlet and a turbine rotor which extracts useful power therefrom; ignition means mounted for initiating ignition of a heated, compressed mixture of hydrogen gas and oxidizing reactant-gas within said combustion structure when a contact switch placed in connection with the inlet valve of the compressed gas in the combustion chamber completes the circuit with the said ignition device, means for obtaining ignition of compressed gas in the combustion chamber means when compression is completed; heating-element means for variably and controlably heating said mixing chamber for gases and mounted in association therewith; sensing and control means for detecting temperature within said combustion chamber means and for regulating rate-of-feed of the rate-of-feed gas control valve means in direct proportion with increase and decrease in temperature respectively within said combustion chamber means, compression occurring in said compression chamber between mixing in said mixing chamber for gases and the firing of said combustion chamber means.

3,956,883

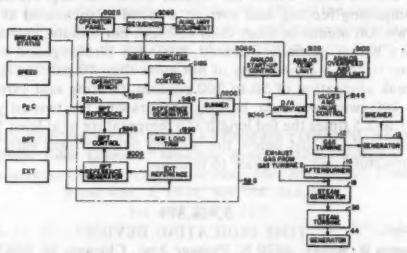
SMOOTH AND HIGHLY RESPONSIVE GAS TURBINE TEMPERATURE LIMIT CONTROL ESPECIALLY USEFUL IN COMBINED CYCLE ELECTRIC POWER PLANTS

Joel M. Anderson, Ypsilanti, Mich.; Kermit R. Wescott, Wilmington, Del.; Milton M. Hobbs, and Roy W. Kiscaden, both of Springfield, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1974, Ser. No. 495,725

Int. Cl.² F02C *7/26*

U.S. Cl. 60—39.14 **34 Claims**



1. A gas turbine electric power plant comprising a compressor section and a turbine section, a plurality of combustors for energizing the driving gas flow for the turbine section, means for generating electric power under the driving power of the turbine, a gas turbine control system including means for controlling the flow of fuel to said turbine combustors, means for generating a fuel reference as an input to said fuel controlling means during speed and load modes of operation, means for generating a combustor shell pressure representation, means for generating a blade path temperature representation, means for generating an exhaust path temperature representation, means for generating a blade path temperature reference as a function of the combustor shell pressure and exhaust temperature representations, and means for limiting

the fuel reference input to limit the turbine blade path temperature in accordance with the outputs of said blade path temperature representation and reference generating means.

3,956,884

GAS TURBINE ENGINE FUEL CONTROL SYSTEMS

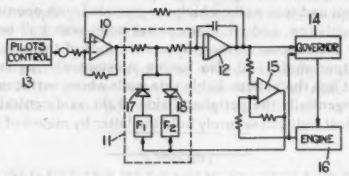
Richard John Eves, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed July 7, 1975, Ser. No. 593,299

Claims priority, application United Kingdom, July 9, 1974, 30311/74

Int. Cl.² F02C 9/04

U.S. Cl. 60—39.28 R **2 Claims**



1. A gas turbine engine fuel control system of the kind comprising a speed governor and means for supplying to the speed governor a speed datum signal, such means including an acceleration control means whereby a limit is placed on the rate of increase of the datum speed signal in accordance with prevailing engine conditions, in which the means for supplying the speed governor with a speed datum signal comprises an integrator, a first difference amplifier comparing the output of the integrator with a demand signal corresponding to the required value of an engine parameter, a limiter circuit connecting the output terminal of the first difference amplifier to the input terminal of the integrator and a second difference amplifier for comparing the output of the integrator with a signal corresponding to the actual value of said engine parameter, said limiter circuit being controlled by the output of the second difference amplifier to decrease the limit applied to the output of the first difference amplifier as the output of the second difference amplifier increases and to reduce the input to the integrator to a negative value (to decrease the output of the integrator) when the output of the second difference amplifier exceeds a predetermined value.

3,956,885

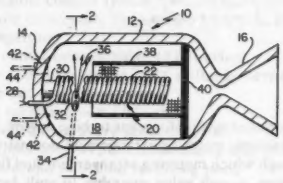
ELECTROTHERMAL REACTOR

Walter S. Davis, Salem, N.H., and T. Kent Pugmire, Carlisle, Mass., assignors to Avco Corporation, Cincinnati, Ohio

Filed Sept. 3, 1974, Ser. No. 502,906

Int. Cl.² F02G 1/02; F02K 9/02

U.S. Cl. 60—39.46 M **13 Claims**



1. An electrothermal reactor for use with hydrazine type liquid fuels comprising:

a reactor body having one end closed and a nozzle formed at the other end of said reactor body, said reactor body, closed end and nozzle defining a reaction chamber therewithin;

a curvilinear surface associated witht said body;

a heat source mounted within said reaction chamber, said heat source maintaining the central portion of said reaction chamber at a reaction temperature while some heat energy is radiated outwardly to said body surface;

fuel injection means for injecting a liquid fuel tangenial to said curvilinear surface; and

means mounted in said reaction chamber to define a reaction stabilizer area within said chamber.

3,956,886

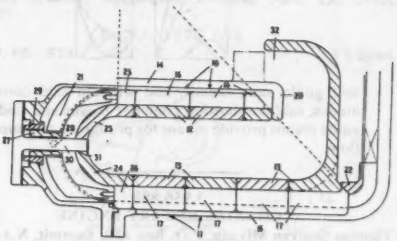
FLAME TUBES FOR GAS TURBINE ENGINES

Gordon Sedgwick, Nelson, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Dec. 7, 1973, Ser. No. 422,844

Int. Cl.² F02G 1/00

U.S. Cl. 60—39.69 **10 Claims**



1. A flame tube comprising a casing, a plurality of side-by-side ceramic rings disposed in said casing, said rings being constituted by a plurality of ceramic tiles arranged in rows which are aligned longitudinally of said casing, a tongue and groove arrangement between each tile and said casing, said tiles being slidable longitudinally of said casing, abutment means between said casing and one end of each tile row, and clamping means at the opposite end of each tile row, said clamping means urging each said tile row against said abutment means, the flame tube being of annular construction, wherein said ceramic rings are arranged in radially inner and outer rows.

3,956,887

GAS TURBINE ENGINES

Alan George MacDonald, Bristol, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed Nov. 11, 1974, Ser. No. 522,846

Claims priority, application United Kingdom, Nov. 15, 1973, 53135

Int. Cl.² F02C 9/00

U.S. Cl. 60—39.2 **10 Claims**

1. A gas turbine core engine or gas generator, comprising:

a. a casing;

b. a single shaft rotatably mounted upon said casing;

c. a multistage compressor means mounted upon the shaft for compressing the gas;

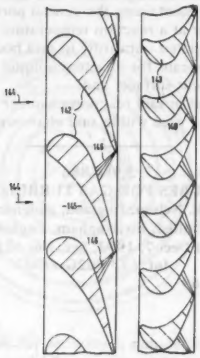
d. a plurality of stator vanes arranged in respective stages, which vanes are mounted on the casing and interdigitated with the stages of the compressor means;

e. means carried on the casing for varying the angle of at least the stator vanes of one of said stages;

f. an annular combustion chamber means, carried on the casing, for combusting the compressed gas with fuel and producing a flow of combustion products;

g. stationary nozzle guide vane means for receiving the flow of combustion products from said combustion chamber means; and

h. a single stage turbine means mounted on said shaft, said guide vane means delivering to said turbine means a flow of combustion products which is supersonic in relation to



said guide vane means, and wherein said compressor means, said combustion chamber means and said nozzle guide means provide means for producing said supersonic flow.

3,956,888

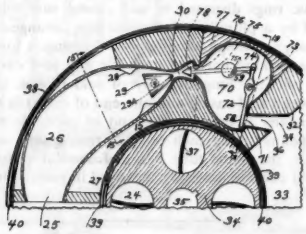
COAXIAL ROTARY ENGINE

Thomas Sanfran Miyada, P.O. Box 430, Summit, N.J. 07901

Filed Jan. 7, 1975, Ser. No. 539,052

Int. Cl.² F02C 7/06, 5/02

U.S. Cl. 60—39.08 **8 Claims**



1. A coaxial rotary engine which is designed to receive air and other gases from suitable sources of supply, to compress and ignite such gases, and to convert the kinetic energy of the expanding gases into usable rotary motion, said engine comprising, in unique and useful combination,

a. a stationary central cylindrical wall, positioned substantially in the engine's midsection, having a peripheral part that has a plurality of para-elliptic openings with pivots rotatably held therein, radial sides with paired grooves, and a central section that has a hub-like center with roller bearings for the support of

b. a central power output shaft;

c. a plurality of coaxial rotors, placed close to the said central cylindrical wall with their radial sides positioned parallel to those of the said wall, each rotor having in its peripheral section a long, arcuate piston, and a fuel and air receiving primary compressing chamber, and in its central section a plurailty of openings containing fan-like blades for the intake of air, and a hub-like part that holds the power output shaft;

d. a plurality of gates, which are supported by the said pivots in the para-elliptic openings of the said central cylindrical wall, and which are designed to swing into the said primary compressing chambers to serve like doors against which the said pistons could compress gases, and to swing out of the paths of said pistons when the primary compression is accomplished;

e. a high pressure compressing chamber, which is located inside each of the said pistons, and which receives gases that were initially compressed in the said primary compressing chamber;

f. a compact combustor, which is located inside each of the said pistons, and which receives compressed gases directly from the said high pressure compressing chamber, and whose content is ignited at regular intervals by

g. an automatic ignition device;

h. oil reservoirs located in said central cylindrical wall and said long, arcuate pistons; and

i. a cuboidal casing having square, comparatively thick, front and rear walls, which are provided with openings for ventilation, and circular central holes with ball bearings for the support of the two end sections of the said power output shaft, and also having substantially rectangular, but less thick, detachable side walls whose surfaces touch tangentially the peripheral side of the said central cylindrical wall and securely hold the latter by means of bolts.

3,956,889

FUEL CONTROL SYSTEM FOR GAS TURBINE ENGINE

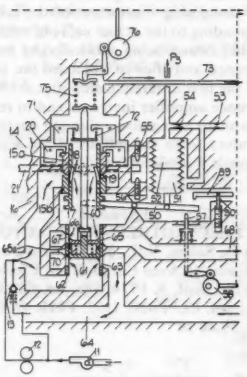
Trevor Stanley Smith, Sutton Coldfield, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed July 18, 1974, Ser. No. 489,752

Claims priority, application United Kingdom, July 18, 1973, 34129/73

Int. Cl.² F02C 9/10

U.S. Cl. 60—39.28 R **4 Claims**



1. A fuel control system for a gas turbine engine, comprising a pump, a variable metering arrangement downstream of said pump, through which metering arrangement fuel flows, in use, to said engine, a spill valve operable to spill fuel from the upstream side of said metering arrangement, a selector device movable during engine starting to a position which corresponds to a requirement to increase fuel flow to the engine, and means operable by movement of said selector device to said position thereof to urge said spill valve shut, so as to increase fuel flow through said metering arrangement.

3,956,890

SOLID PROPELLANT BINDER AND PROPELLANT

Kenneth E. Davis, Taylor, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Sept. 7, 1961, Ser. No. 136,677
Int. Cl.² C06D 5/00
U.S. Cl. 60—219 19 Claims

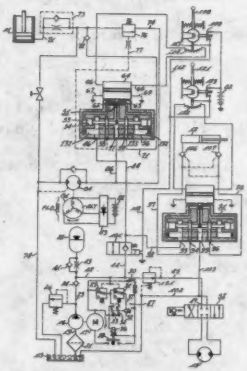
1. A solid polyurethane propellant binder composition which comprises a polyurethane composition comprising the reaction product of nitrocellulose plasticized with a plasticizer selected from the group consisting of nitroglycerin and triethyleneglycol dinitrate, an aromatic diisocyanate and a polyol having a molecular weight of about 500 to 3,000 selected from the group consisting of dicarboxylic acid-polyol-polyesters and polyoxyalkylene ethers, and mixtures thereof, wherein said plasticizer is present in the proportion of about 40 to 60 parts by weight per 100 parts by weight of binder composition, wherein said nitrocellulose contains about 11.0 to 13.0% nitrogen and is present in the proportion of about 0.7 to 1.0 part per part of said polyol, and wherein said diisocyanate is present in an amount to provide an NCO/OH ratio of said diisocyanate to said polyol of about 1.2/1 to 3.0/1.

3,956,891

CLOSED CENTER HYDRAULIC SYSTEM FOR LIFT TRUCKS

Arvin Karazija, Oak Forest, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 30, 1974, Ser. No. 537,610
Int. Cl.² F15B 1/02, 11/16
U.S. Cl. 60—413 9 Claims



1. A hydraulic control system for a lift truck having a reservoir, a source of pressure fluid, and a hydraulic lift jack, said system comprising:

a closed center control valve (51) having

a flow control element (53) shiftable between neutral, raise and lower positions,

a fluid receiving port (57) and

a pair of fluid delivery ports (58, 59),

a fluid supply line (44) interconnecting said source of pressure fluid and said fluid receiving port,

a fluid delivery line (71) interconnecting one (59) of said delivery ports and said lift jack,

a fluid return line (74) interconnecting said lift jack (11) and said reservoir (18) in bypassing relation to said control valve (51),

a pilot operated bypass valve (76) interconnecting one (59) of said delivery ports and said lift jack,

a pilot line (77) interconnecting the other (58) of said delivery ports and said bypass valve (76),

said lift jack (11) being expanded when said flow control element (53) is shifted to said raise position and

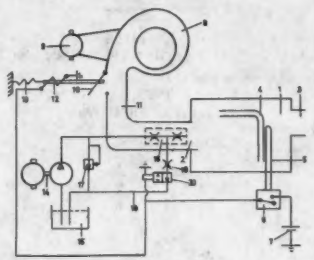
said pilot operated bypass valve (76) being adjusted from its closed condition to its open condition by pressure fluid in said pilot line (77) when said flow control element (53) is shifted to said lower position whereby fluid from said jack (11) flows to said reservoir (18) by way of said return line (74) without passing through said control valve (51).

3,956,892

FUEL-AIR REGULATING SYSTEM FOR HOT GAS ENGINES

Per Henrik Nystrom, Borensberg, Sweden, assignor to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Nov. 13, 1974, Ser. No. 523,337
Claims priority, application Sweden, Nov. 13, 1973, 7315235
Int. Cl.² F02G 1/06
U.S. Cl. 60—524 3 Claims



1. A system for regulating the supply of air and fuel to the combustion chamber of a hot gas engine operating in two heat generating modes to permit the high temperature level of the working gas in said combustion chamber to vary between a predetermined upper limit and a predetermined lower limit with small deviations above and below a predetermined temperature, comprising:

a. means for supplying a mixture of fuel and air to the combustion chamber; and

b. temperature controlled means effective to increase the supply of said mixture to a constant quantity per unit of time that exceeds that required by the engine for maximum output when the high temperature level of the working gas has dropped to its lower limit below the desired temperature and to reduce the supply of said mixture to a constant quantity per unit of time that is less than that required for the idling of the engine when the temperature of the working gas has reached its upper limit above the desired temperature.

3,956,893

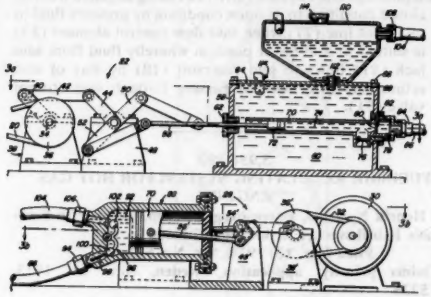
HYDRAULIC POWER TRANSMISSION

Clifford E. Putnal, 3428 Ave. S, Galveston, Tex. 77550

Filed Dec. 23, 1974, Ser. No. 535,679
Int. Cl.² F15B 15/18
U.S. Cl. 60—464 14 Claims

1. In a torque multiplying power transmission, a piston pump assembly, a piston motor assembly, open circuit conduit means operatively interconnecting the pump and motor assemblies, reciprocating drive means connected to the pump and motor assemblies for respectively imparting and transmitting reciprocatory movement at a predetermined stroke ratio

higher than one, a refillable reservoir connected to said open circuit conduit means and pressure responsive valve means



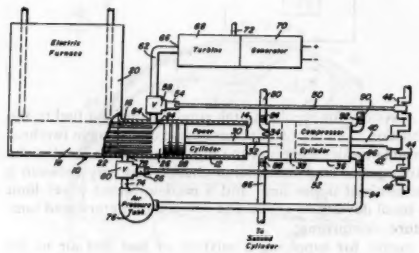
connected to the motor assembly for maintaining the pump assembly continuously filled with fluid from the reservoir.

3,956,894

AIR-STEAM-VAPOR EXPANSION ENGINE

Robert C. Tibbs, Hospital Drive, Cleveland, Miss. 38732

Filed July 17, 1973, Ser. No. 379,957
Int. Cl.² F03G 7/06
U.S. Cl. 60—508 9 Claims



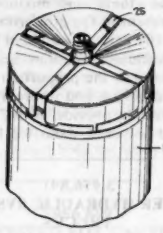
1. A fluid expansion engine including a cylinder having a reciprocal piston therein, one end of said cylinder comprising an expansion chamber, a plurality of elongated heat exchange members including first spaced end portions thereof projecting endwise into said chamber, a heat energy source disposed exteriorly of said chamber, said heat exchange means including second spaced end portions thereof projecting endwise into and disposed in good heat transfer relation with said heat energy source exteriorly of said chamber, said heat exchange members operative to rapidly transfer heat energy absorbed by said second end portions of said heat exchange members to said first end portions of said heat exchange members, fluid supply means operatively associated with said chamber and piston for injecting fluid under pressure into said chamber in timed sequence with reciprocation of said piston and for expansion of said fluid as a result of said fluid being heated by said first end portions of said heat exchange members, and exhaust means operatively associated with said chamber for exhausting expanded fluids from said chamber in timed sequence with reciprocation of said piston, and energy conversion means operatively associated with said exhaust means operative to convert the fluids expanded in said chamber and exhausted from the latter into rotational torque.

3,956,895

HEAT ENGINE

Jack E. Noble; Peter Riggle, both of Benton City; Stuart G. Emigh, and William R. Martini, both of, Richland, all of Wash., assignors to The United States of America as represented by the Administrator of the National Institute of Health, Washington, D.C.

Division of Ser. No. 328,075, Jan. 30, 1973, Pat. No. 3,855,795. This application Oct. 10, 1974, Ser. No. 513,871
Int. Cl.² F01B 29/10
U.S. Cl. 60—516 2 Claims



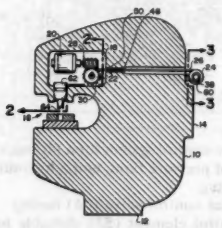
1. In a heat engine operating on a regenerative cycle and having a cylinder, the end portions of which define, respectively, a hot chamber and a cold chamber, a regenerator and a displacer piston, the end portions of which respectively extend into the hot and cold chamber, the improvement comprising a flexure support for the hot end of the displacer piston, said flexure support operating to allow the displacer piston to move longitudinally while restricting lateral motion.

3,956,896

METHOD AND APPARATUS FOR DISPLACING FLUID

Charles A. Bailey, 4156 Marland Drive, Columbus, Ohio 43224

Filed Apr. 18, 1975, Ser. No. 569,366
Int. Cl.² F15B 7/00
U.S. Cl. 60—545 8 Claims



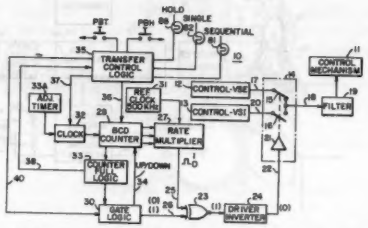
1. Apparatus for displacing fluid under pressure comprising:
a. means defining a fluid-filled pressure chamber;
b. a movable pressure-responsive member in fluid communication with said chamber;
c. an elongated, flexible, substantially incompressible piston extending through said means into said pressure chamber; and
d. other means in said pressure chamber for progressively drawing said flexible piston into said pressure chamber whereby to displace fluid under pressure therefrom.

3,956,897

DIGITAL TRANSFER CONTROL SYSTEM FOR DUAL MODE TURBINE OPERATION

William E. Zitelli, Media, Pa., and Leaman B. Podolsky, Wilmington, Del., assignors to Westinghouse Electric Corporation, Pittsburgh, PA

Filed Jan. 27, 1975, Ser. No. 544,604
Int. Cl.² F01K 13/02
U.S. Cl. 60—660 18 Claims



1. A system for transferring control of a steam turbine between a single and a sequential mode of operation, said system comprising

a plurality of steam inlet valves;

means to generate first control signals for operating predetermined steam inlet valves to control the flow of steam in a sequential mode;

means to generate second control signals for operating predetermined steam inlet valves to control the flowing steam in the single mode;

means when operated to initiate a transfer from the sequential mode to the single mode of operation and vice versa;

switching means operable to a first condition and a second condition, said switching means connecting the first control signals to the predetermined steam inlet valves when in the first condition and connecting the second control signals to the predetermined steam inlet valves when in the second condition;

means responsive to the operation of the transfer initiating means when the switching means is in the first condition to operate the switching means from the first to the second condition repetitively at a successively increasing frequency to a predetermined maximum frequency during a first portion of each transfer from the sequential to single mode;

means responsive to the operation of the transfer initiating means when the switcing means is in the second condition to operate the switching means from the second to the first condition repetitively at a successively increasing frequency to a predetermined maximum frequency during a first portion of each transfer from the single to the sequential mode;

means to operate the switching means repetitively at a sucessively decreasing frequency during the final portion of each transfer to the opposite condition of that to which the switching means is operated at an increasing frequency during the first portion of each transfer; and

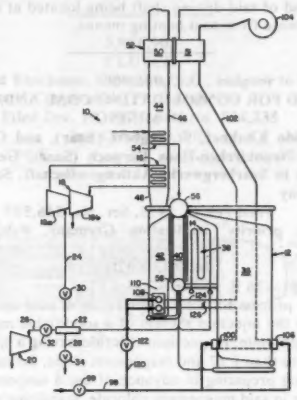
filtering means to average the first and second repetitive control signals throughout the transfer, whereby the control signal applied to the predetermined valves gradually changes from either the first to the second or the second to the first control signal during the transfer.

3,956,898

MARINE VAPOR GENERATOR HAVING LOW TEMPERATURE REHEATER

Carl Frederick Horlitz, Jr., Bloomfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 20, 1974, Ser. No. 535,007
Int. Cl.² F22B 37/06; F01K 19/00
U.S. Cl. 60—676 13 Claims



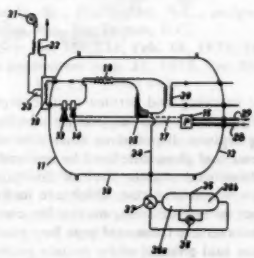
1. In a marine power plant installation including a multistage ahead turbine, an astern turbine, a vapor generator including an evaporator section having an upper drum, a lower drum, a bank of evaporator tubes interconnecting said drums, a superheater, a reheater, burner means for generating combustion gases to supply heat to said vapor generator and means for selectively supplying superheated and reheated vapor to said ahead turbine and only superheated vapor to said astern turbine, the improvement comprising said reheater being disposed downstream in the combustion gas flow sense from said tube bank and said superheater, and supplemental burner means operative when reheated vapor is supplied to said ahead turbine.

3,956,899

GAS TURBINE PLANT WHERE A CIRCULATING MEDIUM IS INDIRECTLY HEATED

Sven-Olof Kronogard, Lomma, Sweden, assignor to United Turbine AB and Co., Kommanditbolag, Malmo, Sweden

Filed Oct. 16, 1974, Ser. No. 515,173
Int. Cl.² F01K 25/10
U.S. Cl. 60—682 3 Claims



1. In a gas turbine plant comprising a compressor and a turbine, said compressor and said turbine being operatively connected within a pressure-proof casing by means of a driv-

ing shaft, said casing having a cylindrical mid portion and first and second domed gables sealing the ends of the mid portion, means within said casing forming a fluid circuit path for an operating fluid, said fluid circuit path interconnecting said compressor and said turbine so that the fluid will pass the same in opposite directions, the improvement comprising coil parts included in said fluid circuit path and directed outwardly from the first of said gables, means at said first gable for heating the fluid in said outwardly directed coil part, and an output end of said driving shaft being located at said second gable, remote from said heating means.

3,956,900

METHOD FOR CONSOLIDATING COAL AND/OR ROCK IN MINING

Hans-Guido Klinkner, St. Ingbert (Saar), and Günter Culmann, Neunkirchen-Haus Furpach (Saar), Germany, assignors to Saarbergwerke Aktiengesellschaft, Saarbrucken, Germany

Filed Feb. 3, 1975, Ser. No. 546,597

Claims priority, application Germany, Feb. 4, 1974, 2405223

Int. Cl.² E02D *3/14*

U.S. Cl. 61—36 R **4 Claims**

1. In a process for the consolidation of coal and/or rock in mines by the injection therein of a solidifiable mixture comprising bentonite, magnesium chloride having a specific gravity of more than 1.22 and magnesium oxide, the improvement comprising preparing in advance of use a suspension of said bentonite in said magnesium chloride, stabilizing said suspension with an acid thickening agent, and adding to said stabilized thickened suspension said magnesium oxide at the time of use so that the mixture hardens.

3,956,901

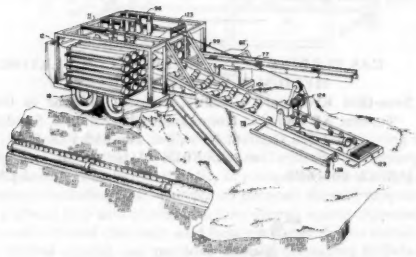
SEWER LAYING SYSTEM

William R. Brown, Rte. 3, Box 125 R6, Post Falls, Idaho 83854

Filed Sept. 26, 1974, Ser. No. 506,133

Int. Cl.² E02F *5/10*; **F16L** *1/00*; **B65G** *13/00*

U.S. Cl. 61—72.1 **34 Claims**



1. A tile carrying and service unit, comprising; a chassis having a framework and supporting wheels; pipe handling bays being regions disposed to each side of the rectilinear center line of said chassis defined by upstanding posts issuing upwardly from said chassis, each of said pipe bays having a platform on which tiles rest which are inclined transversely with respect to said chassis, means for conveying tiles discharged transversely from said pipe bay platforms to a point distally from said chassis; and

lift means for said platforms, and means for discharging individual tiles from the uppermost layer of tiles in each of said pipe bays, which has been disposed to discharge to said means conveying said tile discharged from said pipe bays out of said unit.

3,956,902

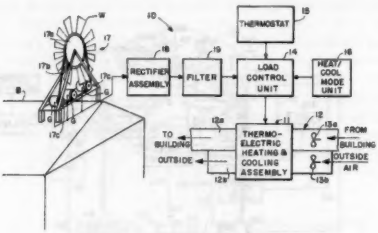
HEATING AND COOLING SYSTEM

Joe C. Fields, Jr., 16023 Debbie Lane, Channelview, Tex. 77530

Filed Mar. 25, 1975, Ser. No. 561,689

Int. Cl.² F25B *21/02*; **F25D** *23/12*; **F03D** *9/00*; **H02P** *9/04*

U.S. Cl. 62—3 **11 Claims**



1. A system for heating and cooling an enclosure comprising:

a. first energy converting means for converting wind energy to mechanical energy;

b. second energy converting means associated with said first converting means and adapted to convert said mechanical energy to varying amounts of electrical energy in proportion to the amount of said wind energy for use in said heating and cooling system;

c. thermoelectric heating and cooling means comprising a plurality of parallel connected thermoelectric devices connected to said second energy converting means for converting said electrical energy to thermal energy, said thermal energy being employed to heat and cool the interior of said enclosure; and

d. control means associated with said thermoelectric heating and cooling means responsive to changes in said varying amounts of electrical energy to selectively and sequentially activate and deactivate ones of said thermoelectric devices to match the thermal energy generated by said thermoelectric means with the amount of said wind energy.

3,956,903

SYSTEM FOR RECOVERING AND CONDENSING VAPORS

Trueman W. Hiller, and Klaus D. Jarr, both of Bettendorf, Iowa, assignors to Weil-McLain Co., Inc., Dallas, Tex.

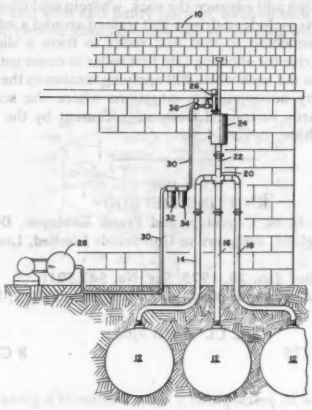
Filed Apr. 25, 1975, Ser. No. 571,510

Int. Cl.² F17C *7/02*

U.S. Cl. 62—54 **21 Claims**

1. A system for recovering and condensing vapors from a liquid storage tank, said system comprising a shell, means connecting the storage tank to said shell for permitting the vapors in said tank to pass into said shell, a liner disposed in said shell for receiving said vapors, a vortex tube adapted for connection to a source of compressed air and adapted to convert said air into a stream of cold air, a helical tube connected to said vortex tube and extending around said liner,

said helical tube being perforated to permit said cold air to discharge therefrom and pass in a heat exchange relation to



said vapors to condense said vapors, and means for passing said condensed vapors back to said storage tank.

3,956,904

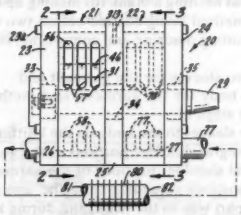
COMPRESSOR-EXPANDER FOR REFRIGERATION HAVING DUAL ROTOR ASSEMBLY

Thomas C. Edwards, Oviedo, Fla., assignor to The Rovac Corporation, Maitland, Fla.

Filed Feb. 3, 1975, Ser. No. 546,391

Int. Cl.² F25D 9/00; F04B 17/00

U.S. Cl. 62—402 **24 Claims**



1. In a refrigeration system, a compressor-expander assembly comprising a housing defining compression and expansion chambers arranged side by side, compressor and expander rotors of cylindrical shape journaled for rotation in the respective chambers and having a common drive connection for rotating the same, vanes equally spaced about the rotor peripheries and having their outer edges extending into effective engagement with the walls of the respective chambers to define compartments between the adjacent vanes, the rotor axis being offset from the chamber axis so that the surface of each rotor extends closely adjacent to the wall of the chamber so that each chamber has a convergent side and a divergent side, the compression chamber having an arcuate inlet port which extends over substantially the entire divergent side and a concentrated compressor outlet port which is located near the end of the convergent side so that air taken in at the inlet port in successive compartments is discharged in the compressed state with an increase in temperature, a heat exchanger for receiving the compressed air and for restoring its temperature to near the ambient level, the expansion chamber having a concentrated inlet port located near the beginning of the divergent side and connected to receive compressed air from the heat exchanger, the expansion chamber having an arcuate expander outlet port which extends over substantially the entire convergent side for discharge of the cold expanded air at ambient pressure, and conduit means for conducting the cold air to the space to be cooled, the concentrated ports being so located relative to the geometry of the rotors that equal masses of air enter and leave the heat exchanger in a given time interval so that the heat exchanger operates at a substantially constant pressure.

3,956,905

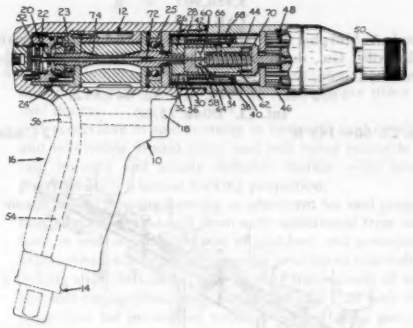
CLUTCH

Clyde David Thackston, Columbia, S.C., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Dec. 19, 1974, Ser. No. 534,235

Int. Cl.² F16D 7/02

U.S. Cl. 64—30 E **10 Claims**



1. A torque-limiting clutch comprising; a driving member, an adjacent driven member, a helical spring connecting said driving member and said driven member by means of frictional surface contact, the wire size of the spring varying from end to end, and means for adjusting the position of said spring longitudinally whereby the cross-sectional area of spring at the point of first contact with said driven member can be varied, in order to adjust the torque at which said spring opens to permit relative movement between said driving member and said driven member.

3,956,906

CONTROL TOP PANTY HOSE AND METHOD OF KNITTING SAME

Edward L. Cassidy, Sr., Burlington, N.C., assignor to Alamance Industries, Inc., Burlington, N.C.

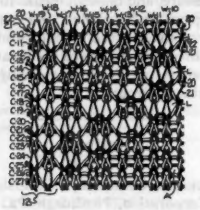
Division of Ser. No. 550,221, Feb. 18, 1975, Pat. No. 3,933,013. This application Aug. 21, 1975, Ser. No. 606,560

Int. Cl.² D04B 9/00

U.S. Cl. 66—42 **5 Claims**

1. A method of knitting the control top panty portion of a lower body garment, such as panty hose, on a multifeed circular knitting machine and wherein said panty portion comprises an attractive pattern of relatively opaque areas surrounded by open lace areas knit of stretch and spandex yarns to provide compressive force against the body of the wearer, said method comprising the steps of feeding main and auxiliary stretch yarns at one knitting station while knitting said main yarn in every wale of both the opaque and open lace areas and while knitting said auxiliary yarn in plated relationship with said main yarn in the opaque areas and selectively knitting and floating said auxiliary yarn in the open lace areas and feeding

a spandex yarn at a second knitting station while knitting the spandex yarn in every wale of the opaque areas and knitting



and tucking the spandex yarn in the wales in the open lace areas in which said main yarn is knit and floated.

3,956,907

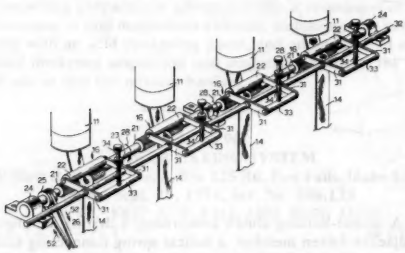
TAKE UP

Lonnie A. Murphy, Chattanooga, Tenn., and Larry E. Rankin, Rossville, Ga., assignors to Wadsworth-Greenwood Corporation, Dalton, Ga.

Filed Mar. 4, 1974, Ser. No. 447,892

Int. Cl.² D04B *15/88*

U.S. Cl. 66—149 R **2 Claims**



1. An apparatus for applying tension to and advancing a knitted sock as the sock is knitted from yarn by a circular knitting machine, comprising:

a rotatable first roller over which the sock passes;

a freely rotatable second roller having a substantially smooth working surface and urging the sock into engagement with the first roller;

arm means having first and second ends, and rotatably mounting said second roller adjacent to said first end;

stationary shaft means displaced from said second roller and disposed intermediate the ends of said arm means;

spring means operatively engaging the second end of said arm means to bias said arm means rotationally about said shaft means and to, therefore, resiliently urge said second roller to press the sock into engagement with said first roller;

means for adjusting the force of said spring means to adjust the pressure with which the second roller presses the sock into engagement with the first roller;

a working surface on the first roller for aligning the sock to advance in a substantially normal direction relative to the rotational axes of the rollers, said working surface including a pair of adjoining helical grooves of opposite hand, which start in the center of the first roller and which advance toward opposite ends of the roller as the roller rotates;

longitudinally extending surface grooves disposed in said first roller to accommodate randomly occurring thickened portions of the sock, said grooves being spaced from one another over a substantial portion of the surface of the first roller; and

means for transmitting rotary motion to said first roller to both tension and advance the sock, wherein said transmitting means includes a driven belt trained around a smooth pulley connected to said first roller to form a slidable friction drive for allowing said first roller to cease rotation relative to the sock while still applying tension to the sock to thereby accommodate situations where the sock is momentarily restrained from advancement by the knitting machine.

3,956,908

KNITTING METHOD

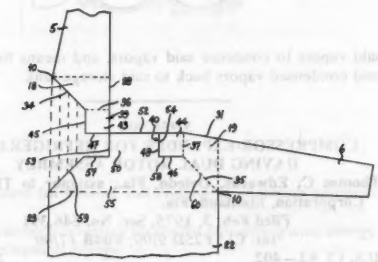
Max William Betts, Coventry, and Frank Robinson, Derby, both of England, assignors to Courtaulds Limited, London, England

Filed Jan. 20, 1975, Ser. No. 542,591

Claims priority, application United Kingdom, Feb. 5, 1974, 5227/74

Int. Cl.² A41B *9/08*

U.S. Cl. 66—175 **8 Claims**



1. A method of knitting a blank for making up into a sleeved garment, said method being carried out on two opposed needle beds of a knitting machine and comprising, in either order, the steps of

a. knitting two sleeves for the garment and

b. knitting a body for the garment, said method also comprising the steps of

c. joining the sleeves to the body on the knitting machine by knitting integral shoulder portions of the garment sleeves and integral shoulder portions of the garment body, said shoulder portions extending from the arm pit regions of the blank part way to the neck, and during knitting of the shoulder portions making successive needles inactive in an inwards direction from the outer eges of the garment on the needle beds, and then reintroducing the inactive needles in opposite sequence thereby causing the sleeves to lie at an angle to the body in the finished garment, and

d. knitting extensions from at least each sleeve shoulder portion to form a part of a shoulder region of the garment adjacent the neck.

3,956,909

PROPORTIONAL KNITTING AND RESULTING ARTICLE

Ettore Negri, Firenze, Italy, assignor to Billi S.p.A., Firenze, Italy

Filed Apr. 4, 1974, Ser. No. 458,023

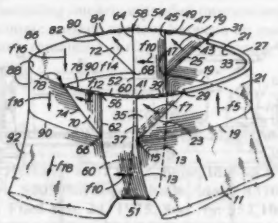
Claims priority, application Italy, Apr. 5, 1973, 9403/73

Int. Cl.² A41B *9/02*

U.S. Cl. 66—177 **7 Claims**

1. A seamless knit proportioned body garment including a panty portion having a knit crotch panel and a waist opening and first and second elongated knit waist panels with at least a portion of their courses extending around the sides of the garment in a generally perpendicular direction to the courses

of the crotch panel and said waist panels separated by the crotch panel the walewise ends of which form part of the waist opening; said body garment also including a pair of legs integrally knit with said panty portion, each of said legs comprising successive complete courses of knitting and one of said



legs having a terminal course a first portion of which is parallely interknitted with a first course of said first waist panel and a second portion of which is parallelly interknitted with a first course of said crotch panel, and likewise the other of said legs having an initial course interknit with both a first course of said second waist panel and a last course of said crotch panel.

3,956,910

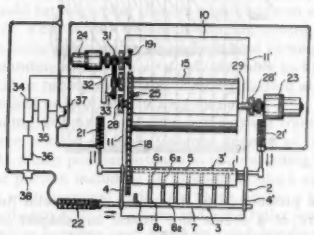
GUIDE ASSEMBLY FOR AN APPARATUS FOR FLUID TREATMENT OF FABRICS IN ROPE FORM

Shigeru Miyayama, Tokyo, Japan, and Jiro Kawaskai, deceased, late of Tokyo, Japan (by Fumiko Kawasaki, legal representative), assignors to United Merchants and Manufacturers, Inc., New York, N.Y.

Filed Jan. 22, 1975, Ser. No. 542,940

Int. Cl.² D06B 3/24

U.S. Cl. 68—176 **1 Claim**



1. In a wince machine having a tank containing treating liquid, a wince roll on which a plurality of convolutions of fabric may be transversely engaged and a driving means for the wince roll and fabric, an improved guide assembly comprising a pair of comb-shaped guide members, each having a plurality of opposing fingers; means for timely reciprocating said assembly transversely with respect to the rotational axis of the wince roll; and means for longitudinally reciprocating at least one of said guide members with respect to said axis in timed relation with said transverse reciprocation of the assembly to regularly shift the convolutions of the fabric in one direction.

3,956,911

LOCK FOR RUNNERS, PARTICULARLY RUNNERS OF SLIDING GLASS DOORS, ON DISPLAY-WINDOW CASES

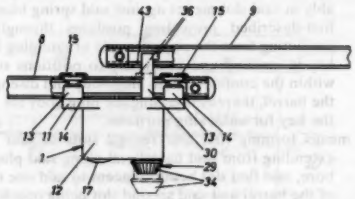
Gerard Corboud, Hahnwald, Germany, assignor to Firma Josef Voss KG., Bruhl, Bezirk Cologne, Germany

Filed Sept. 14, 1973, Ser. No. 397,277

Claims priority, application Germany, June 20, 1973, 2331369

Int. Cl.² E05B 65/08; E05C 5/02

U.S. Cl. 70—100 **3 Claims**



1. A lock for sliding doors comprising:

a housing mounted on one of said doors and having an opening alignable with a bore provided in the other of said doors;

a bolt receivable in said housing in line with said opening and receivable in said bore, said bolt being rotatable in said housing and axially shiftable therein while being provided with a lateral locking projection;

means in said housing forming an abutment for said projection restraining said bolt from axial withdrawal from said bore in one angular position of said bolt and permitting axial withdrawal in another angular position of said bolt;

a locking slide shiftable in said housing transversely of said bolt and engageable in one position of said slide with said projection for preventing rotation thereof while permitting such rotation in another position of said slide;

a locking cylinder mounted in said housing parallel to said bolt and adapted to receive a key, said cylinder being rotatable to shift said slide; and

an actuating handle on said bolt operable from the exterior of said housing to rotate said bolt and selectively engage said projection with said abutment and release said projection from said abutment.

3,956,912

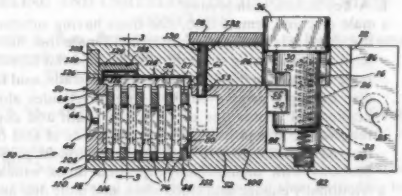
FILING CABINET LOCK HAVING PLATE TUMBLER-TYPE PLUG ASSEMBLY

John S. Broska, Chicago, Ill., assignor to Chicago Lock Co., Chicago, Ill.

Filed Jan. 29, 1975, Ser. No. 544,884

Int. Cl.² E05B 29/04

U.S. Cl. 70—360 **7 Claims**



1. In a filing cabinet lock including a barrel having a generally elliptical cross section and a cylindrical plug-receiving bore extending longitudinally from one end of the barrel adjacent to one of its narrow, rounded sides, the improved combination with:

a key plug rotatably received in said barrel and including a cylindrical body received in said plug-receiving bore and an enlarged cylindrical head on the body, said plug body having transverse tumbler-receiving slot means and a longitudinal keyway intersecting said slot means,

a plurality of plate tumblers and tumbler springs mounted in said slot means for cooperation with a single-bitted key inserted in said keyway, said tumblers projecting from one side of said plug body yieldably under the bias of said springs for locking interengagement with said barrel, and upon insertion of a key said tumblers being moved slidably in said slot means against said spring bias from their first-described projecting positions through positions projecting from the opposite side of said plug body as the key is inserted and ultimately to positions substantially within the confines of the plug body and disengaged from the barrel, thereby releasing the plug body for rotation by the key for unlocking purposes,

means forming first and second slots in said barrel and extending from said barrel end along said plug-receiving bore, said first slot being adjacent to said one narrow side of the barrel and said second slot being opposite thereto, said first and second slots receiving the projecting ends of said tumblers in their respective first and second-described projecting positions, said plug head covering the outer end of said first slot and a portion of the outer end of said second slot, and

a cover member mounted on said barrel and covering the remainig portion of the outer end of said second slot, whereby access to said slots from outside of the barrel is prevented.

3,956,913

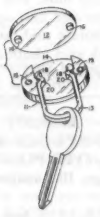
KEY HOLDER

Raymond W. Howard, P.O. Box 717, Ketchum, Idaho 83340

Filed Jan. 27, 1975, Ser. No. 544,430

Int. Cl.² A47G *29/10*

U.S. Cl. 70—456 R **5 Claims**



1. A key holder, comprising:

a male disc and female disc, said discs having substantially the same exterior configuration, said male disc having at least one face being substantially flat, said flat face of said male disc having diametrically opposed studs, said female disc having a groove cut into one of its sides along its diametrical center line of sufficient width and depth to receive the grip portion of a key, said side of said female disc having said groove being provided on its projecting portions with diametrically opposed holes which may frictionally engage said studs when said male disc and said female disc are in proper registry, each of the sidewalls of said groove being provided with an opposing projecting portion; and

a detachable mounted key clip, said clip being a U-shaped member having interiorly bent recesses adapted to engage said projecting portions of said groove when said clip is engaged with sidewalls of said groove.

3,956,914

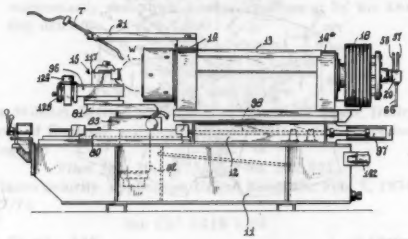
SPIN LATHE

Joseph Prochaska, Menominee, Mich., assignor to The Marison Company, South Elgin, Ill.

Filed Nov. 14, 1974, Ser. No. 523,717

Int. Cl.² B21D *22/14*

U.S. Cl. 72—80 **16 Claims**



14. In a spin lathe having a rotary work holding spindle and a forging tool associated therewith, electrically controlled hydraulic means operable to cause the forging tool to repeatedly sweep across the work piece, an electric circuit for said control means, an hydraulically controlled on-off switch in said circuit effective to control the length of the sweep of said forging tool, and a manually adjustable cam for actuating said switch.

3,956,915

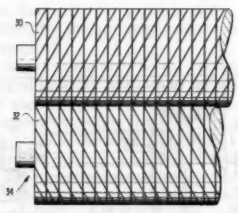
DRAWING AND IRONING CONTAINER STOCK AND MANUFACTURING METHODS

William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Mar. 25, 1975, Ser. No. 561,832

Int. Cl.² B21B *27/02*

U.S. Cl. 72—198 **7 Claims**



1. In the production of flat rolled sheet metal for use in manufacture of a drawn and ironed cup-shaped container body having a bottom wall and a unitary sidewall,

a continuous-strip method for improving lubricant adhesion to one surface of such strip material and decreasing surface contact on the remaining surface during subsequent drawing and ironing operations, comprising the steps of

providing flat rolled sheet metal in continuous-strip form,

processing such continuous-strip to selected gage by cold rolling in continuous-strip rolling mill means including performing final cold reducing operations to impart a selected surface texture, such final cold reducing operations including the steps of

providing roll stand means with surface contact rolls of preselected embossed finishes, and

passing the continuous-strip through such roll stand mean to impart a pattern of surface indentations on such continuous-strip surfaces,

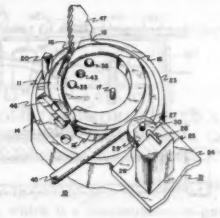
such surface indentations including linearly extended impressions providing a textured surface for holding lubricant on that surface of the continuous-strip to be exposed to ironing rings working on an exterior surface of a cup drawn from such continuous-strip,

with the remaining surface of the continuous-strip flat rolled sheet metal being treated simultaneously during passage through such roll stand means to imprint surface indentations including linearly extended impressions for decreasing intimate surface contact between an ironing mandrel and such remaining surface during ironing operation on such cup.

3,956,916
METHOD AND APPARATUS FOR MAKING FISHING LURES

Edward C. Herkner, 4407 Plum, Boise, Idaho 83703, and John J. Turner, 6005 Northview, Boise, Idaho 83704

Filed Feb. 24, 1975, Ser. No. 552,100
Int. Cl.² B21D *7/028*
U.S. Cl. 72—217 **1 Claim**



1. A mandrel being provided with a suitable, controlled reciprocating turning means comprising:

a base and die assembly including a mounting portion, an upstanding cylindrical collar carried by said mounting portion, a turning collar on said cylindrical collar, said turning collar having an upstanding stop portion, a turning guide carried by said turning collar and including an annular groove in one side thereof, said annular groove issuing into a second annular groove in the uppermost planar surface of said turning collar, a pivot post carried by said turning collar distally mounted from said turning guide, a cut-off slot in said upstanding turning guide, said slot being disposed at an angle in said turning guide, an upstanding material hold-down assembly locking pin and a rod or tubing stock stop pivotally carried at one of the terminal ends of said turning guide;

a bending assembly including a mounting frame having a sleeve portion suitably fastened to one of its terminal ends, a base portion fastened to said mounting frame, said base portion including an upstanding block carried near one of its terminal ends, said block having a pair of outwardly projecting brackets, and a die roller journalled for rotation between said brackets, said bending assembly being rotatably carried by said sleeve on said cylindrical collar of said base and die assembly;

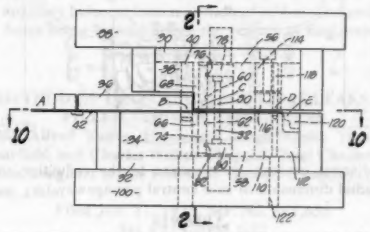
a die hold-down assembly having one of its terminal edges rounded to correspond with the innermost face of said turning guide of said base and die assembly and its opposite terminal edge and side terminal edges being staight, said die hold-down assembly being privotally carried on said pivot post of said base and die assembly, said die hold-down assembly including an annular groove and a cut-off slot in registry and correspondence with said groove and said cut-off slot of said base and die assembly being juxtapositioned by said upstanding locking post of said base and die assembly; and

tensioning means provided between said hold-down assembly and said base and die assembly.

3,956,917
METHOD AND APPARATUS FOR CUTTING AND FORMING PLANAR MATERIAL

Kurt C. Kerseg, La Crescenta, Calif., assignor to Multifid Corporation, La Crescenta, Calif.

Continuation-in-part of Ser. No. 387,189, Aug. 9, 1973, abandoned. This application June 4, 1975, Ser. No. 583,691
Int. Cl.² B21D *28/00*
U.S. Cl. 72—337 **16 Claims**



1. An apparatus for automatically cutting and forming multifid brush contacts from an elongated thin strip of planar material comprising:

a. first guide means for receiving the strip of material and positioning it within the apparatus;

b. means for moving the strip of material forwardly of the apparatus within said guide means;

c. first cutting means located proximate said first guide means for cutting the strip of material to a predetermined width;

d. second cutting means located forwardly of said first cutting means for forming a multiplicity of uniformly spaced apart slits in the strip of material;

e. third cutting means located forwardly of said second cutting means for cutting the strip of material transversely of the slitted portion of the strip of material so as to form a multiplicity of spaced apart finger-like projections; and

f. cutting and forming means located forwardly of said third cutting means for cutting the strip of material transversely of the portion of the strip located immediately adjacent the rearward extremity of the slitted portion thereof and for forming the fingerlike projections into a predetermined cross-sectional configuration.

3,956,918
SPECIAL CRIMPING COLLET MECHANISM WITH REELING AND UNREELING TECHNIQUE ON STRIP CONTACTS

Anumolu S. Rao, Broadview, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

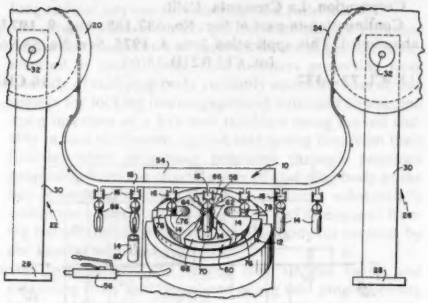
Filed Oct. 21, 1974, Ser. No. 516,643
Int. Cl.² B21D *41/00*; **B21J** *7/16*
U.S. Cl. 72—402 **4 Claims**

1. A tool for crimping a hood on one contact carried on a web carrying spaced adjacent contacts comprising:

a collet having a central passageway for receiving said one contact and hood and having a pair of slots extending in opposite radial directions relative to said central passageway, each said slot having a portion for receiving one of said closely spaced adjacent contacts; and

a tapered chuck receiving said collet for movement in one direction therein to reduce the radial dimension of said central passageway for crimping said hood on said one contact the walls of each said slot receiving one of said

closely spaced adjacent contacts being spaced from said closely spaced contacts to avoid deformation of said



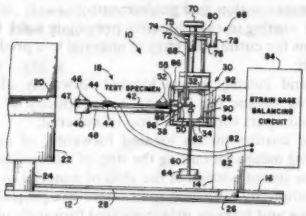
adjacent contacts in response to the reduction in the radial dimension of said central passageway.

3,956,919

HIGH TEMPERATURE STRAIN GAGE CALIBRATION FIXTURE

Thomas Vranas, Hampton, Va., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Dec. 19, 1974, Ser. No. 534,266
Int. Cl.² G01L *25/00*
U.S. Cl. 73—1 B **13 Claims**



1. An apparatus for calibrating high temperature strain gages in the bending mode comprising:

furnace means containing a heating area;

support means capable of placement within the heating area of said furnace;

test specimen means attached to said support means;

strain gages to be evaluated, attached to said test specimen means;

loading adapter means attached to said test specimen means;

dead weight loading means to apply force to said loading adapter means;

constant deflection loading means to deflect said loading adapter means a fixed amount independent of said dead weight loading means;

deflection measuring means; and

strain gage reading means for calibrating said strain gages.

3,956,920

DUAL FUNCTION PRESSURE TRANSDUCER

Herman Richard Kollmeyer, 3090 Arlington Ave., Riverside, Calif. 92506

Filed Apr. 14, 1975, Ser. No. 568,077
Int. Cl.² G01L *9/02*
U.S. Cl. 73—398 AR **10 Claims**

2. A dual function pressure transducer for providing a pressure readout signal and indicating the crossing of a pressure threshold comprising:

a housing,

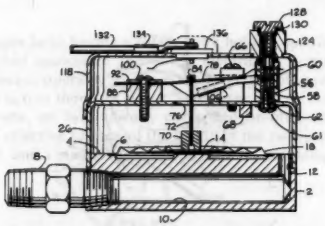
a resistance element supported by said housing, said element having a wiping surface,

a pressure sensing means having a member adpated for displacement relative to the magnitude of a sensed pressure,

switch-arm means coupled to said pressure sensing means for movement thereby along a predetermined path,

an electrical contact member carried by said switch-arm means and adapted to wipe against said resistance element when said switch-arm means moves along said path, and

adjustable switch-pole means supported by said housing and cooperating with said switch-arm means to switch between first and second modes when said switch-arm means crosses a predetermined position, said switch-pole means comprising a cylindrical member rotatably supported by said housing, a portion of the outer surface of



said member being electrically conductive and the remainder of said surface being electrically non-conductive, and including a generally helical boundary between said conductive and non-conductive portions, the position of said switch-arm means at which switching occurs thereby being adjustable and determined by the rotational position of said cylinder,

said contact member and element being connected in a first electric circuit the total resistance of which is determined by the relative position of said member along said element, thereby providing an indication of the pressure sensed by said sensing means,

said switch-arm means and said switch-pole means being connected in a second electric circuit, whereby an indication of a sensed pressure crossing a selected pressure threshold level may be obtained by adjusting said switch-pole means so that switching occurs when the switch-arm means is at the position along its path corresponding to sensing of the selected pressure level by said pressure sensing means.

3,956,921

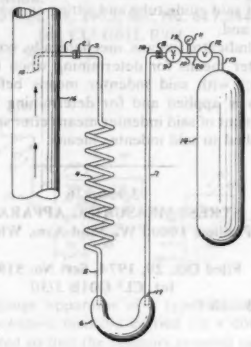
SAMPLING DEVICE

James B. Himes, Bloomingdale; Hysam Chechakli, Des Plaines, and Irvin A. Beranek, Villa Park, all of Ill., assignors to The Richardson Company, Des Plaines, Ill.

Filed Apr. 30, 1974, Ser. No. 465,508
Int. Cl.² G01N *1/24*
U.S. Cl. 73—421.5 R **3 Claims**

1. A sampling device comprising: a condensing means comprising a coiled elongated tubular means having inlet and outlet means; said outlet means connected to a trap means comprising an elongated tubular chamber; said trap means connected to a first elongated connecting tube, which tube is connected to a throttling valve means; said throttling valve means connected to a second elongated connecting tube which second tube is connected to a vacuum chamber through

a vacuum chamber valve means wherein the inside diameter of said coiled elongated tubular means is smaller than a average inside diameter of said elongated tubular chamber of said trap means.



3,956,922

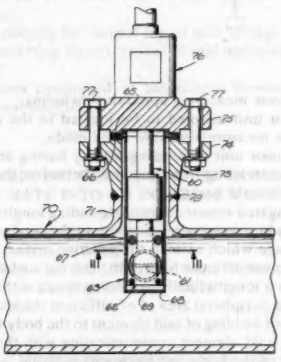
DENSITOMETER PROBE SHIELD AND WELL

Milton H. November, Hacienda Heights, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 530,943, Dec. 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 528,870, Dec. 2, 1974, abandoned, which is a continuation-in-part of Ser. No. 470,528, May 16, 1974, abandoned. This application Feb. 10, 1975, Ser. No. 548,276

Int. Cl.² G01N 9/00

U.S. Cl. 73—32 A 14 Claims



12. A vibration densitometer assembly comprising: a base; means including a sidewall providing a chamber sealed except for one end opening toward and sealed to said base, a fluid exit hole, and at least a second hole through said sidewall adapted to, for example, face the flow of fluid in a pipeline at a first predetermined angle relative to the direction of fluid flow to permit fluid flow into and out of said chamber without turbulence; a vibration densitometer probe mounted on said base in said chamber, said probe having one end spaced from said base, said probe having a vibratable member extended downwardly through said means one end into said chamber in a position to be immersed in the fluid therein; and a shield fixed relative to said probe in a position inside said chamber partially surrounding said member to prevent a calibration shift, said means including a hollow cylinder providing said sidewall, and a circular disc closing the other end of said cylinder except for said fluid exit hole extending centrally therethrough, said second hole being generally circular and extending through said cylinder, said second hole having an axis in a plane perpendicular to the axis of said cylinder, said first predetermined angle being equal to +40°, said cylinder having an auxiliary generally circular hole therethrough the same diameter as that of said second hole and having an axis in said plane at a second predetermined angle of −80° relative to the axis of said second hole, said fluid exit hole being enerally circular and having a diameter less than that of said second and auxiliary holes, at least a portion of said second and auxiliary holes being located above the bottom of said member.

3,956,923

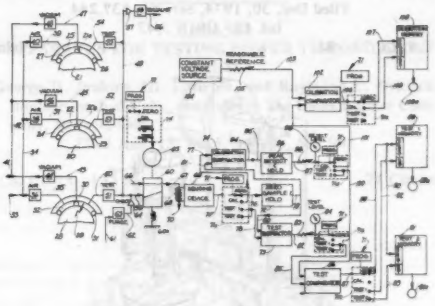
METHOD OF DETECTING SMALL GAS LEAKS IN FILLED AEROSOL CONTAINERS

Gerald Alfred Young, Cincinnati; Hugh Ansley Thompson, Fairfield, and Charles Wilbur Chappell, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 17, 1975, Ser. No. 541,855

Int. Cl.² G01M 3/32

U.S. Cl. 73—49.3 22 Claims



1. A method of detecting small gas leaks in a filled, pressurized container comprising the steps of placing said container in a closable test chamber, closing said test chamber, evacuating said test chamber, sealing said test chamber while under vacuum for a predetermined time to permit any leakage gas from said container to accumulate and diffuse within said chamber, introducing a carrier gas into said evacuated chamber, holding said carrier gas within said chamber for a predetermined time to permit said leakage gas and said carrier gas to co-mingle and equilibrate, and thereafter transferring said co-mingled and equilibrated gases to a detector for said leakage gas.

3,956,924

SYSTEM AND METHOD FOR MEASURING MEAT TENDERNESS

Leo J. Hansen, Clarendon Hills, Ill., and Harry E. Lockery, Sudbury, Mass., assignors to Armour and Company, Phoenix, Ariz.

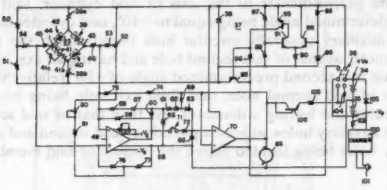
Continuation of Ser. No. 778,551, Nov. 25, 1968, abandoned. This application Oct. 22, 1971, Ser. No. 191,841

Int. Cl.² G01N 3/42

U.S. Cl. 73—81 15 Claims

1. A system for measuring the tenderness of meat upon cooking by non-destructive testing of raw meat comprising: a probe having a plurality of needles and a handle, said probe adapted to have said needles inserted directly into said meat by the hand of an operator; a flexible diaphragm mounted to said probe and adapted to deflect in response to the insertion

of said needles; strain measuring means mounted on said diaphragm for generating a force signal representative of the penetration resistance force encountered as said needles are inserted in said meat; means receiving said force signal including storage means for storing a signal corresponding to the peak of said force signal; and output means receiving the signal stored in said storage means for converting said stored signal to an output signal representative of the tenderness of said meat.

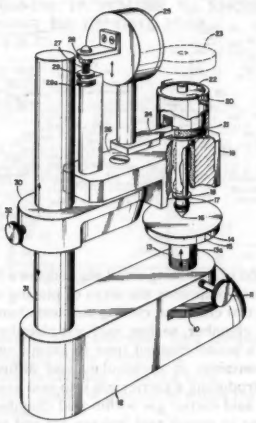


3,956,925

HARDNESS TESTER

Samuel C. Smith, 210 Hartman Road, Newton, Mass. 02159

Filed Dec. 30, 1974, Ser. No. 537,244
Int. Cl.² G01N *3/42*
U.S. Cl. 73—81 **7 Claims**



1. An apparatus for testing the hardness of thin plastic films having a thickness of about **1/1000-1/8** inch comprising in combination:

a. horizontal sample platform means for holding a sample to be tested together with means for limited vertical movement of said sample platform means;

b. indenter means comprising a vertical shaft having a precision pointed indenter fixed to the lower end of said shaft together with horizontal weight platform means attached to said shaft for supporting a weight;

c. almost-frictionless bearing and washer means for supporting said indenter means in a vertical position above said sample platform means and permitting limited vertical movement of said indenter means so as to bring the tip of said pointed indenter into contact with the top of said sample platform while restraining said indenter means from any angular deviation from vertical;

d. weight means supported vertically above said weight platform means and capable of being applied to said indenter means by resting freely on said weight platform means wherein said weight has lateral protrusions and slides within a vertical guide tube which is notched to accommodate the said protrusions and additionally comprising a flexible washer as a shock absorber at the bottom of said guide tube and sitting on top of said indenter shaft; and,

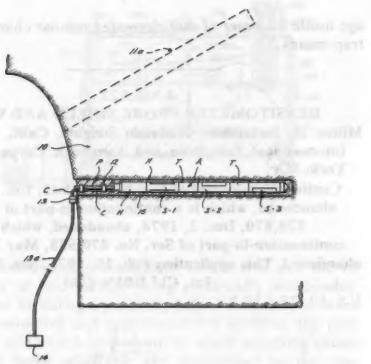
e. dial indicator means mechanically connected to said indenter means for determining when the sample is in contact with said indenter means before said weight means is applied and for determining the vertical displacement of said indenter means after said weight means is applied to said indenter means.

3,956,926

STRESS MEASURING APPARATUS

Oliver V. Phillips, 10405 W. 32nd Ave., Wheat Ridge, Colo. 80033

Filed Oct. 29, 1974, Ser. No. 518,635
Int. Cl.² G01B *5/30*
U.S. Cl. 73—88 E **13 Claims**



1. A stress measuring apparatus including,

a sensor unit adapted to be located in the area in which stress measurements are to be made,

said sensor unit comprising a body having an internal passage extending from one end thereof to the exterior surface of said body,

an elongated sensor element extending longitudinally of the body in overlying relationship to that end of said internal passage which exits to the exterior surface of the body,

said sensor element having its internal surface recessed to form a longitudinally extending space within the element and a peripheral area of of sufficient thickness in order to permit welding of said element to the body without distortion, said element communicating with the internal passage of the body and having its external surface exposed to the area under measurement, so that the stress forces within the area act upon said external surface of said sensor element,

a hydraulic fluid filling said internal passage and said space within the sensor element, said sensor element being responsive to changes in stress forces acting upon the exterior of the sensor element, which changes are transmitted to the hydraulic fluid to vary the pressure of said hydraulic fluid accordingly,

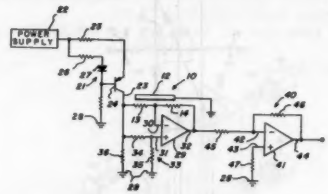
means for indicating the variations in the hydraulic fluid pressure as caused by changes in stress, and

means establishing communication between the internal passage of said body and said indicating means to transmit hydraulic fluid pressure variations to the indicating means.

3,956,927
STRAIN GAUGE TRANSDUCER APPARATUS

Robert P. Pearson, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 29, 1975, Ser. No. 617,544
Int. Cl.² G01L *9/04*
U.S. Cl. 73—88.5 SD **11 Claims**



1. In strain gauge apparatus of a type wherein first and second strain sensitive resistors carried on a common substrate are oriented so that the resistors respond oppositely to environmental conditions affecting the substrate, improved circuitry for determining the environmental forces by measuring variations in an electrical property of the resistors comprising:

an operational amplifier having inverting and noninverting input terminals and an output terminal;

a current source for supplying substantially constant electric current;

a current sink;

means connecting the first strain sensitive resistor between the current source and the inverting input terminal of said operational amplifier;

means connecting the second strain sensitive resistor between the output and inverting input terminals of said operational amplifier;

a voltage divider connected between said current source and said current sink, said voltage divider having an output tap;

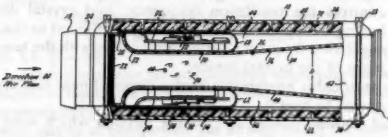
means connecting the output tap of said voltage divider to the noninverting input terminal of said operational amplifier; and

output means connected to the output terminal of said operational amplifier.

3,956,928
VORTEX SHEDDING DEVICE FOR USE IN MEASURING AIR FLOW RATE INTO AN INTERNAL COMBUSTION ENGINE

Carlos M. Barrera, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 28, 1975, Ser. No. 572,605
Int. Cl.² G01M *15/00;* **G01F** *1/32*
U.S. Cl. 73—116 **9 Claims**



1. A vortex shedding device for use in measuring the rate at which air flows into the air intake of an internal combustion engine, said device comprising:

a conduit having a passage within it through which air whose flow rate is to be measured may flow, said passage having a venturi section formed in it, said venturi section being of rectangular cross-section throughout and having width and height dimensions, said venturi section including an inlet portion, a throat portion smaller in cross-sectional area than the cross-sectional area of said inlet portion, a converging portion between said inlet and throat portions, and a diverging portion extending away from said throat portion toward the end of said passage remote from said inlet portion, said converging and diverging portions of said venturi section being formed by the variation of at least said height dimension, said conduit having four walls defining said venturi section of said passage, at least one of said walls having a recess formed in it, said recess being located between two other of said walls;

an elongated element for generating vortices in air flowing in said passage in a direction from said inlet portion toward said diverging portion, said elongated element being located in said throat portion of said passage and extending transverse to said direction of air flow;

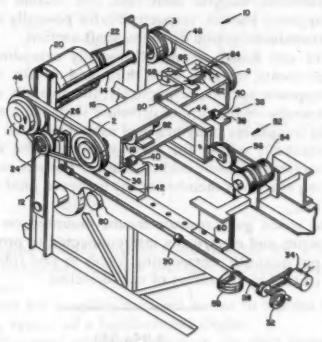
circuit means for use in determining the frequency or rate at which vortices are generated in air flowing past said elongated element, said circuit means being mounted within said recess in said one wall of said conduit; and

a cover enclosing said recess and said circuit means within said recess, said cover including means for establishing a thermal barrier between said circuit means within said recess and the medium in which said vortex shedding device is immersed.

3,956,929
APPARATUS FOR TESTING POWER TRANSMISSION BELTS

George H. Jenkins, III, Littleton, and Raymond C. Dykstra, Boulder, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Aug. 15, 1975, Ser. No. 601,902
Int. Cl.² G01M *13/02*
U.S. Cl. 73—133 R **22 Claims**



1. Apparatus for testing power transmission belts comprising:

a first rotatably mounted shaft with at least two pulleys attached;

a second rotatably mounted shaft translatably spaced from and substantially parallel with the first shaft, the second shaft with at least two pulleys that are substantially longitudinally aligned with the pulleys of the first shaft to define test and control pulley pairs and wherein at least one of the pulleys of the control pair is a variable pitch pulley;

means for rotating one of the shafts;

means for selectively varying the pitch diameter of the variable pitch pulley;

means for translating the second shaft in relation to the first shaft; and

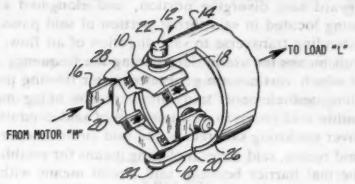
means for adjusting the second shaft to substantially parallel alignment with the first shaft.

3,956,930

DRIVELINE TORQUE AND/OR THRUST SENSOR

Ralph S. Shoberg, Farmington, Mich., assignor to GSE, Inc., Farmington Hills, Mich.

Filed Sept. 23, 1974, Ser. No. 508,231
Int. Cl.² G01L 3/14
U.S. Cl. 73—133 R **8 Claims**



1. A force measurement transducer for an automotive driveline of the type comprising plural shaft sections:

an integral body of high modulus of elasticity material having a substantially annular configuration, said body including four uniformly spaced rigid sectors conjoined by flexure struts of substantially lesser cross-section than said sectors, each of said struts being oriented at right angles to the two next adjacent struts,

first and second oppositely radially extending connector elements integral with first and second diametrically opposite sectors, respectively, for pivotally securing said transducer to one driveline shaft section,

third and fourth oppositely radially extending connector elements integral with third and fourth diametrically opposite sectors, respectively, for pivotally securing said transducer to another driveline shaft section,

said transducer body being of such dimension as to fit substantially within the cross-sectional area of said shaft sections whereby said transducer body is capable of acting as a cross-member of the universal joint in said driveline,

and strain gage resistor means mounted on said flexure struts and electrically interconnected to produce an output quantity representing forces in said transducer body caused by operation of said driveline.

3,956,931

METHOD FOR DETERMINING THE PREFERRED DIRECTION OF ROTATION OF A TIRE

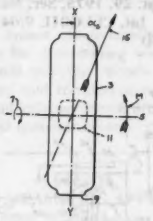
Karl Alfred Grosch, Rott; Gerhard Franz-Josef Senger, Aachen, and Georg Freudenstein, Aachen-Brand, all of Germany, assignors to Uniroyal Inc., New York, N.Y.

Division of Ser. No. 518,025, Oct. 25, 1974. This application Sept. 22, 1975, Ser. No. 615,668
Claims priority, application Germany, Nov. 6, 1973, 2355387
Int. Cl.² G01M 17/02
U.S. Cl. 73—146 **2 Claims**

1. A method for determining the preferred direction of rotation of a vehicle tire comprising the steps of:

determining the direction of rotation of the tire in which the lateral structural force acting on the tire is greater; and

marking the tire in a manner indicating the direction of rotation in which said lateral structural force is greater, whereby the tire may be mounted on a vehicle so that the conventionally forward direction of rotation of the tire is the direction of greater lateral structural force so that the effect of the forces acting on the tire which tend to alter its direction of travel are minimized.

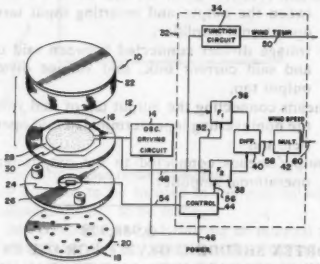


3,956,932

WIND SENSOR

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of James B. Stephens, La Crescenta, and Eric G. Laue, San Marino, both of Calif.

Filed Jan. 29, 1975, Ser. No. 545,282
Int. Cl.² G01F 1/68
U.S. Cl. 73—189 **10 Claims**



1. A wind sensor comprising:

a housing;

an energizable oscillator mounted on said housing, including an oscillator driving circuit and a crystal device which controls the oscillation frequency, said crystal device having an appreciable temperature coefficient so that the oscillation frequency varies appreciably with the temperature of the crystal device;

a controllably energizable heater disposed near said crystal device to heat it;

said housing having an opening through which wind can pass to change the temperature of said crystal device; and

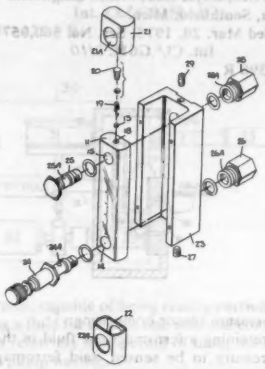
control means for energizing said crystal oscillator while maintaining said heater substantially unenergized at a first time, so that the oscillation frequency is dependent upon the wind temperature, and for energizing both said crystal oscillator and said heater at a second time, so that the oscillation frequency is dependent upon the wind speed as well as the wind temperature, whereby to permit a determination of the wind speed as well as the wind temperature.

3,956,933

VARIABLE AREA FLOWMETER

Harold W. Metzger, Willow Grove, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed July 23, 1974, Ser. No. 491,467
Int. Cl.² G01F 1/22
U.S. Cl. 73—209 3 Claims



1. A rotameter comprising:

A. a transparent plastic bar having flat front and rear faces and a generally rectangular cross section encapsulating a thin-walled variable-area borosilicate glass tube having a precision molded longitudinally-extending variable-area passage therein containing a float, said bar having a lateral bore at the lower end portion thereof communicating through a duct with the inlet of the tube and having a lateral bore at the upper end portion thereof communicating through a duct with the outlet of the tube,

B. a channel-shaped frame member adapted to receive said bar and having a wall which abuts the rear face of said bar, the front face of the bar being exposed and having indicia inscribed thereon, said wall having holes therein in registration with said lateral bores, and

C. hollow retaining elements extending through said bores into said holes to engage inlet and outlet pipe couplers socketed in the holes in said wall, said retainer elements having openings therein communicating with said ducts whereby fluid admitted into said inlet coupler passes through said tube passage into said outlet coupler, one of said retainer elements being a control valve.

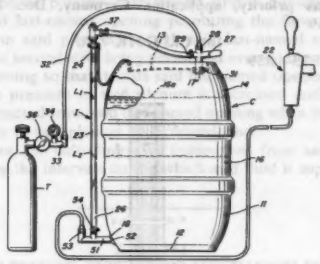
3,956,934

LIQUID LEVEL INDICATOR FOR PRESSURIZED LIQUID CONTAINER

Joseph Montague White, No. 8 Ansell St., Portsmouth, Va. 23703

Filed Aug. 20, 1975, Ser. No. 606,211
Int. Cl.² G01F 23/02
U.S. Cl. 73—323 10 Claims

1. A level indicator for continuously displaying the level of a supply of liquid in a pressurized container having an inlet for communicating the interior of the container with an associated source of pressurized gas and an outlet for the liquid, the level indicator comprising, in combination: a gauge tube of transparent material having an upper end and a lower end; means for vertically mounting said gauge tube on the exterior of the container; means for communicating said gauge tube upper end with the associated source of pressurized gas whereby the pressure in the upper end of the container interior is substantially the same as in said gauge tube upper end; conduit means connected to the container outlet and to said gauge tube lower end for conducting liquid from said container into both said gauge tube and to a remote use location; and a check valve disposed in said gauge tube at said gauge tube upper end for substantially blocking the rapid flow of pressurized gas from said gauge tube upper end to said gauge



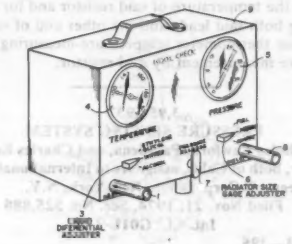
tube lower end; whereby the liquid is continuously maintained in said gauge tube at a level corresponding to the liquid level in said container throughout variations in the level of liquid in said container as the liquid is periodically dispensed from said container.

3,956,935

ENGINE COOLING SYSTEM FAULT ANALYZER

Curtis A. Ford, Hempstead, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Dec. 24, 1974, Ser. No. 536,260
Int. Cl.² G01K 1/02
U.S. Cl. 73—347 1 Claim



1. An engine cooling system fault analyzer for a liquid-cooled engine having a radiator, said fault analyzer comprising duct means;

inlet means for coupling the duct means to a point in the cooling system of a liquid-cooled engine;

liquid differential adjusting means in the duct means for adjusting for the type of antifreeze, water, and the like, in the cooling system;

thermometer means in the duct means for detecting and indicating the temperature of the liquid in the system;

pressure means in the duct means for detecting and indicating the pressure of the liquid in the system;

outlet means for coupling the duct means to another point in the cooling system of the engine;

gage adjusting means coupled to the pressure means for adjusting the pressure means for the size of the radiator;

pressure release means in the duct means for releasing the pressure therein; and

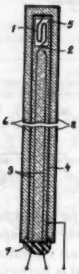
a portable housing accommodating the duct means, the inlet means, the liquid differential adjusting means, the thermometer means, the pressure means, the gage adjusting means, the pressure release means and the outlet means.

3,956,936

TEMPERATURE-MEASURING SYSTEM

Heinz Brixy, Julich, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Dec. 26, 1973, Ser. No. 428,352
Claims priority, application Germany, Dec. 27, 1972, 2263469
Int. Cl.² G01K 7/30
U.S. Cl. 73—359 4 Claims



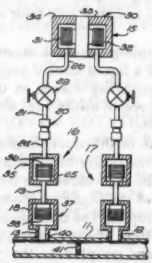
2. A temperature-measuring device comprising, in combination, a body having an insulating portion, a noise-temperature resistor mounted on said insulating portion, a thermocouple having a junction connected to one end of said resistor and a pair of leads connected to branches of the thermocouple and extending out of said body, a thermocouple temperature-indicating circuit; a noise-thermometer temperature-measuring circuit; and circuit means for selectively connecting said leads to said thermocouple temperature-indicating circuit for measuring the temperature of said resistor and for selectively connecting both said leads and the other end of said resistor to said noise thermometer temperature-measuring circuit for temperature measurement by said resistor.

3,956,937

PRESSURE SENSING SYSTEM

Victor Nicholas Lawford, Pasadena, and Charles Edwin Long, Whittier, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 21, 1974, Ser. No. 525,888
Int. Cl.² G01L 7/06
U.S. Cl. 73—395 4 Claims



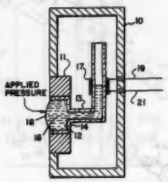
1. A pressure sensing system, said system comprising: a first bellows assembly adapted for connection from a source of fluid under pressure; a second bellows assembly connected from said first bellows assembly; and conduit means including a detachable coupling connecting said second bellows assembly to a pressure sensitive instrument, said first and second assemblies being difficult or impossible to disconnect from said source whereby said first assembly isolates fluid from said source from said second assembly and a fluid sealed space is formed between said first and second assemblies.

3,956,938

PRESSURE SENSORS UTILIZING FERROMAGNETIC FLUIDS

John Paul Carrico, Royal Oak, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 20, 1975, Ser. No. 560,057
Int. Cl.² G01L 9/10
U.S. Cl. 73—398 R 7 Claims



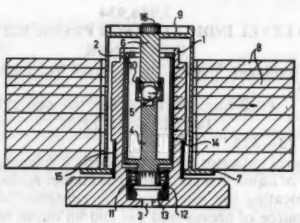
1. A fluid pressure sensor comprising:
means for retaining a ferromagnetic fluid in the proximity of the pressure to be sensed, said ferromagnetic fluid being physicaly displaced in response to changes in said pressure to be sensed;
means for sensing said displacement, said means for sensing being responsive to the magnetic characteristics of said ferromagnetic fluid to provide an output representative of said displacement;
said means for retaining including a capillary, said ferromagnetic fluid extending into said capillary so that the level of said fluid within said capillary changes in response to changes in the pressure being sensed; and
said means for sensing includes a coil positioned in the proximity of said level so that changes in said level change the permeability of said coil to produce a signal proportional to said displacement.

3,956,939

ROTARY-PISTON MEASURING DEVICE

Willi Bonk, Hamburg, and Heinz Delin, Wedel, Holst, both of Germany, assignors to H. Maihak A.G., Hamburg, Germany

Filed Feb. 27, 1975, Ser. No. 553,665
Claims priority, application Germany, Mar. 1, 1974, 2409825
Int. Cl.² G01L 7/16
U.S. Cl. 73—419 12 Claims



1. A rotary-piston pressure measuring device, comprising a cylinder having spaced ends; a piston slidably and turnably received in said cylinder; means for admitting a pressure fluid into said cylinder at a lower one of said ends; weight means; and connecting means, including a ball and socket structure connecting said piston with said weight means for the latter to move with and act counter to the pressure exerted by said

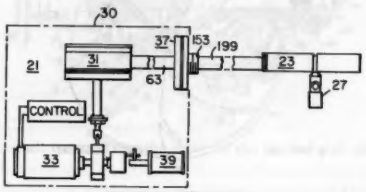
pressure fluid, said piston being hollow and formed with an axially extending internal projection, and said structure including a ball in contact with a free end of said projection.

3,956,940

SAMPLING OF FLUID

Lloyd V. Guild, 358 Church Road, Bethel Park, Pa. 15102

Filed May 5, 1975, Ser. No. 574,269
Int. Cl.² G01N *1/22*
U.S. Cl. 73—421.5 R **16 Claims**



1. Apparatus, capable of being readily carried by personnel, for sampling a fluid for at least one selected component in said fluid over a relatively long period of time, the said apparatus including a pump having:
   a. a plenum to contain said fluid,
   b. a membrane connected to said plenum actuable to flex to increase and decrease the pressure of said fluid in said plenum, and
   c. a valve, said valve including:
      1. a first plate having an opening of small area therein through which fluid to or from said plenum may be transmitted, and
      2. a first tensioned strip of yieldable resilient material stretched over and adjacent to the surface of said plate and over said opening, whereby when the difference between the fluid pressure in said plenum and the fluid pressure on the surface of said strip opposite said opening is of one polarity, the portion of said strip over said opening is sucked into said opening and seals said opening preventing the flow of fluid to or from said plenum through said opening, and when said difference is of the opposite polarity, said strip is retracted from said opening permitting the flow of fluid to or from said plenum through said opening; said first strip being positioned over said opening so that it is retracted from said opening when the pressure in said plenum is increased and seals said opening when the pressure in said plenum is decreased,

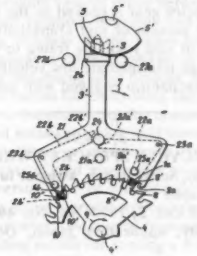
Said apparatus also including means, connected to said membrane, for actuating said membrane to alternately increase and decrease the fluid pressure in said plenum respectively above and below the pressure on said opposite surface of said strip, during successive intervals during said time period, and means, connected to said plenum, for supplying said fluid to said plenum during the intervals during which the pressure in said plenum is decreased, the said supplying means including:
   a. additional valve means for preventing flow of fluid through said supplying means during the intervals during which said pressure in said plenum is increased and for permitting the flow of fluid to said plenum during the intervals during which the pressure in said plenum is decreased, said additional valve means including:
      1. a second plate having an opening of small area therein through which fluid to or from said plenum may be transmitted, and
      2. a second tensioned strip of yieldable resilient material stretched over and adjacent to the surface of said plate and over said last-named opening, whereby when the difference between the fluid pressure in said plenum and the fluid pressure on the surface of said second strip opposite said last-named opening is of said one polarity, the portion of said second strip over said last-named opening is sucked into said last-named opening and seals said last-named opening preventing the flow of fluid to or from said plenum through said last-named opening, and when said difference is of said opposite polarity, said second strip is retracted from said last-named opening permitting the flow of fluid from said plenum through said last-named opening, said second strip being positioned over said last-named opening so that it seals said last-named opening when the pressure in said plenum is increased and and is retracted from said last-named opening when the pressure in said plenum is decreased, and
   b. means for collecting said component from said fluid during the intervals during which said fluid is supplied.

3,956,941

ESCAPEMENT-TYPE DRIVE MECHANISM FOR WATCHES AND THE LIKE

Christian Faivre, Morteau, France, assignor to Les Fabriques d'Assortments Reunies, LeLocle, Switzerland

Filed Dec. 18, 1974, Ser. No. 533,771
Claims priority, application Switzerland, Jan. 18, 1974, 672/74
Int. Cl.² G04B *15/00*
U.S. Cl. 74—1.5 **9 Claims**



1. An escapement-type drive mechanism comprising:
an escapement wheel formed with a circumferential array of teeth spaced apart by respective radial slots and displacement faces inclined to respective radii;
an angularly oscillatable lever engageable with said wheel for intermittently rotating same, said lever being formed with a pair of spaced-apart pallets mounted for lost motion on said lever and alternately engageable with said faces and receivable in said slots to step said wheel upon angular oscillation of said lever; and
magnetic means on said lever yieldably biasing each of said pallets in a respective direction of its lost motion relative to said lever, said lever being formed with a pair of elements each carrying a respective one of said pallets, and a single member fixed on said lever and magnetically cooperating with both said elements.

3,956,942

MECHANISM PRODUCING A LINEAR RECIPROCATING OUTPUT MOTION WITH A LOW SPEED INTERVAL NEAR THE CENTER OF THE STROKE

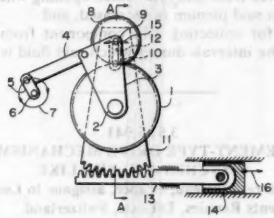
Mitsuru Seki, Sagamihara, and Toru Hosoda, Zama, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Mar. 19, 1974, Ser. No. 452,521

Claims priority, application Japan, Mar. 22, 1973, 48-31840

Int. Cl.² F16H *37/12*

U.S. Cl. 74—52 4 Claims



1. A mechanism for generating a reciprocating motion having a low velocity portion in its stroke, comprising a stationary gear, a rockable frame rockably supported on a center shaft of said stationary gear, a rotatable gear journalled on said rockable frame and rollable on the outer periphery of said stationary gear, a sector gear rotatably mounted on the center shaft of said stationary gear and having a radially extending elongated slot; a crankshaft connected to said rotatable gear and having an eccentric portion disposed in said elongated slot of said sector gear, said eccentric portion being movable along an epicyloid curve, and a slider connected to said sector gear such that said sector gear is rocked by the epicycloidal curve of the eccentric portion of said crankshaft produced by the rocking motion of said rockable frame to reciprocally move said slider with an intermediate low velocity portion through a transmitting mechanism engaged with said sector gear.

3,956,943

BICYCLE SPROCKET WHEEL

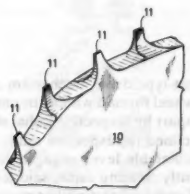
Kazuto Yamasaki, Sakai, Japan, assignor to Maeda Industries, Ltd., Sakai, Japan

Filed Oct. 5, 1973, Ser. No. 403,836

Claims priority, application Japan, Oct. 25, 1972, 47-122954

Int. Cl.² F16H *55/30*

U.S. Cl. 74—243 R 4 Claims



1. A bicycle sprocket wheel comprising a bicycle sprocket wheel body containing a plurality of teeth integrally formed along the peripheral surface of the sprocket wheel, said teeth having a base portion and a free end portion and being alternately disposed on the left and right side of said peripheral surface, said left and right side teeth being flush with the side of the sprocket wheel body and tapered from their base portion of their narrower free end portion.

3,956,944

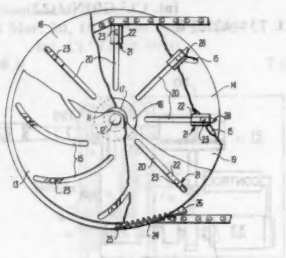
TORQUE OPERATED, VARIABLE DIAMETER BELT SHEAVE OR CHAIN SPROCKET

Leo L. Tompkins, 127 Wacester St., Jackson, Miss. 39209

Filed Jan. 2, 1975, Ser. No. 538,217

Int. Cl.² F16H *55/30, 55/54*

U.S. Cl. 74—244 4 Claims



1. In a power transmission system having a chain sprocket engaging an endless chain, for receiving an input torque and transmitting an output torque, the improved means for varying the torque transmission ratio comprising:

a. a plurality of segments disposed concentrically about a shaft, said segments engaging said endless chain;

b. an outer pair of disks each having a plurality of spiral slots therethrough extending in a generally radial direction, attached to said shaft so as to rotate therewith, said outer pair of disks being spaced apart along the axis of said shaft and being substantially perpendicular thereto;

c. an inner pair of disks each having a plurality of radial slots therethrough, attached to said shaft so as to rotate about said shaft, said inner pair of disks being spaced apart along the axis of the shaft and located between said outer pair of disks;

d. means attached to each segment to engage one slot in each of said disks such that relative rotation between the outer pair of disks and the inner pair of disks causes said segments to move radially with respect to said shaft,

e. a tooth movably attached to each of said segments for engaging said endless chain between rollers of said chain; and,

f. means to bias said tooth so as to protrude radially from said segment, said biasing means allowing said tooth to retract into said segment when contacted by a chain roller in a predetermined direction.

3,956,945

DRIVING TRANSMISSIONS FOR MOTOR VEHICLES

Geoffrey Donald Eggleton, and Richard Harrison, both of Aldershot, England, assignors to County Commercial Cars Limited, Aldershot, England

Filed Feb. 28, 1974, Ser. No. 447,002

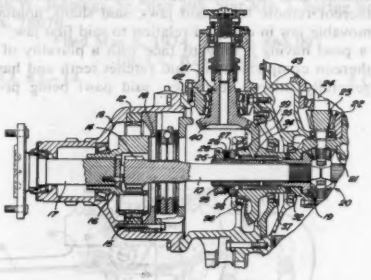
Claims priority, application United Kingdom, Mar. 7, 1973, 11108/73

Int. Cl.² F16H *1/44*

U.S. Cl. 74—710.5 2 Claims

1. A driving transmission having two half shafts connected to a pair of land wheels driven by a differential gear mechanism connected to the half shafts, and a differential lock coaxial with one of the half shafts and drivingly connectable with the differential carrier, wherein the differential lock is separated from the differential carrier by a hollow shaft encircling said one half shaft, which hollow shaft is adapted to be driven by the differential carrier and drivingly connectable with the differential lock, there being provided drive means in driving relation between the hollow shaft and a second pair of land wheels, and wherein the differential lock is carried by a

first sleeve joined to a second sleeve mounted on said one half shaft, by a third sleeve, said third sleeve being encircled by the



hollow shaft transmitting the drive to the second pair of land wheels.

3,956,946

SPEED CHANGE GEAR SYSTEM

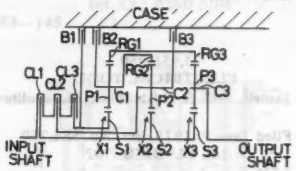
Noboru Murakami, Nagoya; Koichiro Hirozawa, Kariya; Kazuo Ohara, and Koichi Matsuo, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Oct. 11, 1974, Ser. No. 514,134

Claims priority, application Japan, Oct. 12, 1973, 48-114984

Int. Cl.² F16H *57/10*

U.S. Cl. 74—759 **5 Claims**



1. A speed change gear system comprising:

an input shaft;

a first sun gear;

a first planetary gear engaged with said first sun gear;

a first ring gear enaged with said first planetary gear;

a first carrier rotatably supporting said first planetary gear;

a second ring gear drivingly connected to said first carrier;

a second planetary gear engaged with said second ring gear;

a second sun gear engaged with said second planetary gear;

a second carrier rotatably supporting said second planetary gear;

a third sun gear drivingly connected to said second sun gear;

a third planetary gear engaged with said third sun gear;

a third ring gear engaged with said third planetary gear and drivingly connected to said first ring gear and said second carrier;

a third carrier rotatably supporting said third planetary gear;

a first clutch for simultaneously coupling or uncoupling said second and third sun gears to or from said input shaft;

a second clutch for simultaneously coupling or uncoupling said second carrier and said first and third ring gears to or from said input shaft;

a third clutch for coupling or uncoupling said first sun gear to or from said input shaft;

a first brake capable of being actuated for locking said first sun gear to a gear casing;

a second brake capable of being actuated for simultaneously locking said first carrier and said second ring gear to said casing;

a third brake capable of being actuated for simultaneously locking said first and third ring gears and said second carrier to said casing; and

an output shaft dynamically and integrally connected to said third carrier.

3,956,947

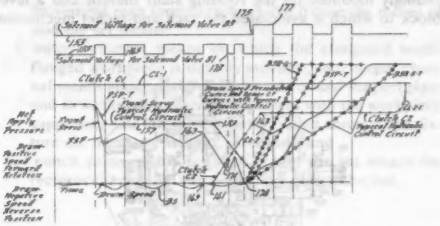
ADAPTIVE CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Maurice Bernard Leising, Clawson; Howard Lee Benford, Bloomfield Hills, and Robert Leslie Bradley, Troy, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed June 14, 1974, Ser. No. 479,320

Int. Cl.² B60K *41/18*; **F16H** *3/74*; **F16D** *43/06*

U.S. Cl. 74—866 **5 Claims**



1. In a control system for an automatic transmission of the type having a housing, an input shaft assembly, an output shaft, a plurality of power transmitting gear assemblies connecting said input shaft assembly and output shaft and adapted to be coupled to provide various ratios between input assembly and output shaft rotation, engaging and disengaging devices for effecting changes in the ratios provided by said power transmitting gear assemblies, and servo means for operating said engaging and disengaging devices, the improvement comprising control means for controlling the application and release of said servo means, means for controlling the operation of said control means to cause said servos to operate in response to the rotational acceleration of at least one of the rotatable components of said assemblies to cause a curve of rotational speed versus time of one of said components to follow substantially along a predetermined path during a shift from one ratio to another, said means responsive to rotational acceleration including means for sensing a rotational characteristic of said one rotatable component, and means connected to said speed sensing means for maintaining said one rotatable component in a substantially incipient slip condition relative to said housing during a portion of a shift from one ratio to another ratio, said one rotatable component, when maintained in said substantially incipient slip condition, alternately and repeatedly being allowed to slip in a rearward direction and then being brought to a substantially zero rotational velocity along a generally undular velocity versus time curve during said portion of said shift.

3,956,948

SHARPENING MACHINE FOR ROOT-CUTTER KNIVES

Michel Andre Pivont, and Paul Alphonse Vicca, both of Tienen, Belgium, assignors to Raffinerie Tirlemontoise, Brussels, Belgium

Filed Apr. 14, 1975, Ser. No. 567,964

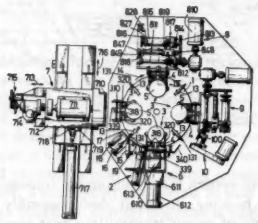
Claims priority, application Belgium, Apr. 12, 1974, 813688

Int. Cl.² B21K *11/02*

U.S. Cl. 76—89.1 **7 Claims**

1. Sharpening machine for root-cutter knives, which comprises a jaw device for supporting a knife to be sharpened, said

knife having a serrated edge to be sharpened, a magazine for knives to be sharpened, a device for feeding singly a knife from the magazine to the jaw device, a rough-sharpening device and a fine-sharpening device for the knives, said sharpening devices each comprising a milling device having a rotary milling cutter, the jaw device being rotatably mounted on a shaft in parallel relationship with the milling cutter rotating shaft, and means being provided to periodically swing the jaw device about the shaft thereof between a position where the knife engages the milling cutter and a rest position where the knife does not engage the milling cutter, the machine comprising moreover a rack-and-rachet mechanism for stepwise movement of the milling cutter relative to the jaw device as well as a cam shaft for controlling the swinging of the jaw device and the rack device, the machine further comprising a horizontal conveyor on which are mounted a plurality of jaw devices, said conveyor having a plurality of stopping positions in each one of which a jaw device is arranged in front of the magazine and in front of each one of the sharpening devices, each sharpening device comprising a milling device which is slidingly mounted on the rotating shaft thereof and a lever block to which is associated the rack-and-rachet mechanism



which is connected to the milling device and which comprises a member for pushing the jaw device to swing same from the non-engagement position thereof to the engagement position where the knife engages the milling cutter, and each jaw device comprising a fixed jaw rotatingly mounted about said swinging shaft and having a knife supporting plate, and a movable jaw frame integral with the fixed jaw and comprising a plunger for pushing the knife against the plate slidingly arranged in the movable jaw frame directed upwards and bearing at the top thereof a jack for operating said plunger a return member being associated to said movable jack frame to swing said device towards the rest position thereof, the knife-supporting plate bearing an ejector slide arranged in the path of said knife and a spring member for moving the slide along a direction which corresponds to the ejection of the knife from the jaw, the magazine comprising a knife-stacking area and a knife-pushing slide arranged at the stack bottom on the fixed jaw plate and operating against the ejector slide spring, and said horizontal conveyor bearing members for operating the jaw device jacks, so as to bring the jack in each jaw device to a position in which said jack causes the plunger to move away from the plate before said device being located in front of the magazine.

3,956,949

WRENCH WITH QUICK ADJUSTING SLIDING JAW AND SELF TIGHTENING ANVIL JAW

Anthony Romano, 6941 Jackson Drive, San Diego, Calif. 92119

Continuation of Ser. No. 342,873, March 19, 1973, abandoned. This application Feb. 18, 1975, Ser. No. 550,179
Int. Cl.² B25B *13/14*
U.S. Cl. 81—135 **4 Claims**

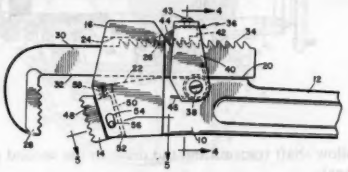
1. A wrench comprising:

a. a body portion with a first jaw thereon;

b. said body portion having a channel therein and a handle portion;

c. a movable jaw having a shank loosely received in said channel and said shank having ratchet teeth on a side thereof remote from said jaws, said shank holding the movable jaw in opposed relation to said first jaw;

d. a pawl having a forward face with a plurality of teeth thereon complementing said ratchet teeth and having a generally smooth rear face, said pawl being pivotally



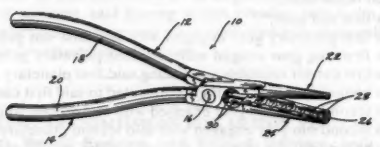
mounted on said body portion and being capable of pivoting from a position clear of the ratchet teeth on said shank to a wedged position in which said rear face abuts a portion of said body portion remote from said jaws and the teeth on said forward face engage the ratchet teeth on said shank, such that said pawl is compressed between a portion of said body portion remote from said jaws and said shank as said jaws are separated, thus locking the shank in adjusted position against movement in one direction in said channel.

3,956,950

ELECTRICAL TOOL

Francis A. Jamell, 805 S. 11th Ave., Marshalltown, Iowa 50158

Filed June 9, 1975, Ser. No. 584,750
Int. Cl.² B25B *7/02*
U.S. Cl. 81—426 **4 Claims**



1. An electrical tool comprising,

a pair of scissors members pivotally interconnected and having oppositely disposed jaw elements,

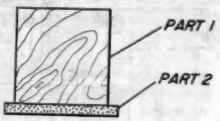
one of said jaw elements having a concave semicylindrical in cross section passageway facing said other jaw and including a plurality of transversely extending grooves, said passageway increasing in diameter from its outer end inwardly,

said other jaw element having a finger having a convex mating surface for mating engagement with said concave passageway, said finger increasing in diameter from the outer end inwardly whereby a length of wire placed between said jaws in one of said grooves will be deformed into an arcuate U-shaped portion upon said jaws being closed.

3,956,951
METHOD OF SHAVING

Joseph W. Jennings, Sr., Box 208, Star Rte. 1, Spring Branch, Tex. 78070

Filed May 8, 1974, Ser. No. 468,097
Int. Cl.² B26D 7/08
U.S. Cl. 83—14 4 Claims

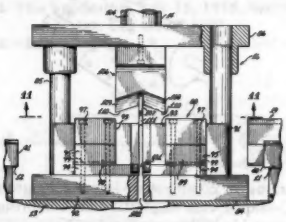


1. A Method of Shaving which comprises the steps of rubbing the wetted skin with a solid, solvent-free mass of selected shape and size of a suitable, high molecular weight, water soluble polymer and thereafter, shaving off unwanted hair with a blade type razor.

3,956,952
EXTRUSION PREPARATION APPARATUS

Robert J. Goettel; Richard J. Goettel, both of 2727 W. Weldon Ave., Phoenix, Ariz. 85017, and Willis D. Smith, 4050 W. Palo Verde Drive, Phoenix, Ariz. 85019

Division of Ser. No. 496,567, Aug. 12, 1974, Pat. No. 3,938,413. This application May 27, 1975, Ser. No. 581,210
Int. Cl.² B26D 5/08
U.S. Cl. 83—145 3 Claims



1. An apparatus for punching an elongated multiflanged workpiece comprises:

a. a support plate;

b. die set means carried on said support plate for punching an elongated multiflanged workpiece when that workpiece is positioned therein, said die set means including a fixture die means having a workpiece supporting and movement path formed therethrough and cutting die means reciprocally movable in a path transverse to the workpiece supporting and movement path formed through the fixture die means;

c. the fixture die means of said die set means having a pair of support dies spaced apart at their upper ends to form a gap therebetween into which portions of the cutting die means of said die set means is reciprocally movable, said pair of support dies also spaced apart at their lower ends to form a reduced width slot therebetween into which a portion of the cutting die of said die set means is reciprocally movable, said pair of support dies having a horizontally extending horizontal passage and a horizontally extending enlarged passage formed therethrough and in which portions of the multiflanged workpiece are slidably movable, the horizontally extending horizontal passage and the horizontally extending enlarged passage formed in said pair of support dies are each disposed transverse with respect to the gap and the slot formed between said pair of support dies;

d. the fixture die means of said die set means also having a backup die having a slot formed therein which is aligned with the gap and the slot between said pair of support dies and into which a portion of the cutting die means of said die set means is reciprocally movable, said backup die spaced from said pair of support dies to provide a horizontally extending vertical passage therebetween in which a portion of the multiflanged workpiece is slidably movable, the horizontally extending vertical passage being disposed transverse to the gap and the slot between said pair of support dies and transverse to the slot formed in said backup die;

e. input channel means on which the elongated multiflanged workpiece is slidably movable, said input channel means adjacent one side of said support plate and in workpiece directing alignment with the workpiece supporting and movement path formed through the fixture die means of said die set means;

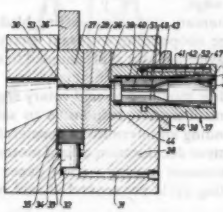
f. output channel means on which the elongated multiflanged workpiece is slidably movable, said output channel means adjacent the opposite side of said support plate and in workpiece receiving alignment with the workpiece supporting and movement path formed through the fixture die means of said die set means; and

g. punch press means coupled to said die set means for reciprocally moving the cutting die means thereof.

3,956,953
DEVICE IN ROD CROSS CUTTING AUTOMATIC MACHINES

Lennart Jan-Åke Lindell, Skovde, Sweden, assignor to Hjo Mekaniska Verkstad, Hjo, Sweden

Filed Sept. 16, 1974, Ser. No. 506,172
Claims priority, application Sweden, Sept. 14, 1973, 73125593
Int. Cl.² B26D 7/02
U.S. Cl. 83—188 1 Claim



1. In a machine for cutting a rod-like material transversely to its longitudinal axis: means for feeding said material through said machine, means for cutting a portion off said rod-like material and brake means arranged in the vicinity of said cutting means for guiding and braking the rod-like material in the vicinity of said cutting means, said brake means including a housing with inner walls, means in said housing for frictionally engaging said material as it is being fed by said feeding means to guide said material in the vicinity of said cutting means, said means for frictionally engaging said material comprising at least two radially movable jaws, a flexible hose in said housing and surrounding said jaws, means sealingly holding said flexible hose in position in said housing adjacent to but outwardly of the ends of said jaws including means for pressing the end portions of said hose outwardly against said inner walls of said housing, and means for introducing a fluid under pressure into said housing outwardly of said flexible hose and between said sealing means for radially inwardly moving said jaws towards said material.

3,956,954

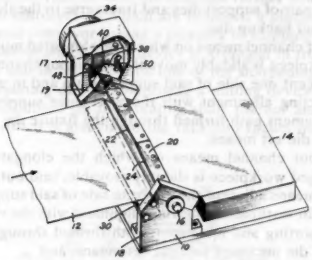
ROTARY PAPER CUTTING DEVICE

William J. Edwards, Oklahoma City, Okla., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Division of Ser. No. 447,703, March 4, 1974, abandoned. This application Feb. 20, 1975, Ser. No. 551,577

Int. Cl.[2] B26D 5/08, 5/34

U.S. Cl. 83—285 2 Claims



1. A paper cutter apparatus for cutting a continuous moving web of paper into predetermined lengths which comprises:

a rotary shaft;

a rotary cutting blade longitudinally affixed on said rotary shaft at an angle to the axis of the shaft, said cutting blade including a pair of cutting edges providing a V-shaped cutting edge;

a complimentary stationary cutting blade, providing a cutting edge cooperating with said rotary cutting blade;

a motor having a motor shaft coupled to said rotary shaft for rotating the rotary cutting blade;

a timing disk mounted to said rotary shaft; and

motor control means, responsive to said timing disk, for commanding an intermittent acceleration followed by an intermittent deceleration of said motor during each cut of the continuous moving web of paper thereby regulating the cutting cycle per second of said rotary shaft.

3,956,955

LEDGERS FOR THE CUTTING DEVICES OF CIGARETTE AND LIKE ROD-MAKING MACHINES

Clifford Russell Marritt, London, England, assignor to Molins Limited, London, England

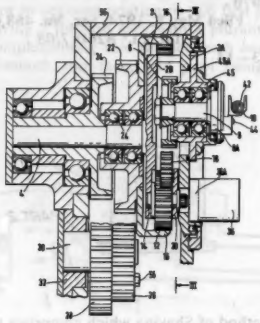
Filed Feb. 6, 1975, Ser. No. 547,416

Claims priority, application United Kingdom, Feb. 8, 1974, 05815/74

Int. Cl.[2] A24C 5/28

U.S. Cl. 83—310 9 Claims

1. A ledger for use in a continuous rod cigarette making machine or a similar machine, comprising a rod support to support the continuous rod during cutting, a rotary member arranged to rotate about a fixed axis, a first planetary gear connected to the rod support and rotatable relative to the rotary member about an axis which is parallel to and spaced from the fixed axis, a second planetary gear mounted rotatably on the rotary member, the first planetary gear being maintained in a fixed orientation at least partly by the action of said second planetary gear, and a rotatably mounted drive gear arranged to rotate about the fixed axis at a speed different



from that of the rotary member and to mesh with said second planetary gear.

3,956,956

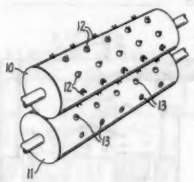
APPARATUS FOR CONTINUOUSLY FORMING OPPOSED C-SHAPED CUTS IN PLASTIC FILM

Arthur Bert Bertholf, San Leandro, Calif., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Sept. 8, 1975, Ser. No. 611,590

Int. Cl.[2] B26F 1/20

U.S. Cl. 83—345 1 Claim



1. Apparatus for continuously forming a pattern of pairs of opposed C-shaped cuts in plastic film comprising a pair of opposed rotatable rollers, one roller having a plurality of punches extending radially therefrom, the other roller having wells therein for receiving the punches, each punch being in the form of a hollow cylinder having means at one end for detachably securing the punch to the roller and a pair of opposed generally V-shaped grooves cut in the other end such that the grooves terminate and meet in two diametrically opposed points lying in a line parallel to the longitudinal axes of the rollers, the bottom of each groove being recessed below the surface of the roller and the edges of the grooves being sharply honed, whereby when plastic film is passed between the rollers the punches form a pattern of pairs of opposed C-shaped cuts in the film.

3,956,957

DEVICE FOR LONGITUDINALLY SEVERING WEBS

Louis Corse, 6, rue Auguste Rodin, Orleans 45018, France

Filed Oct. 29, 1974, Ser. No. 519,046

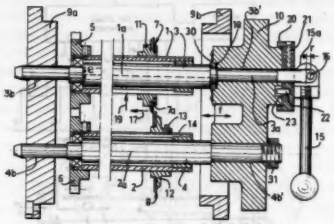
Claims priority, application France, Oct. 30, 1973, 73.38672

Int. Cl.[2] B23D 19/04; B26D 1/14

U.S. Cl. 83—482 8 Claims

1. A device for longitudinally cutting a web of material comprising: a frame, first and second shafts mounted in said frame for rotation about spaced parallel axes, means for driv-

ing said shafts in opposite directions, a circular cutting blade mounted on said first shaft for rotation therewith, a circular counter blade mounted on said second shaft for rotation therewith, first means for engaging and disengaging said blades, said first means comprising control means operable to displace one of said shafts axially and radially, and second



means for adjusting said blades transversely of a web to be cut, said second means comprising a support, means for locking said shafts in position relative to said support against movement in the axial direction of said shafts, and displacement means interconnecting said frame and support for displacing said support and said shafts relative to said frame in the axial direction.

3,956,958

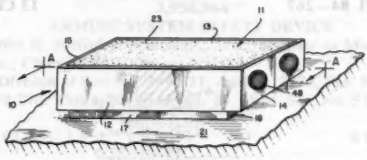
DEVICE FOR PRODUCING A SIGNAL IN RESPONSE TO A MOVEMENT THEREON

Daniel T. Nash, 35 Colony Road, New Haven, Conn., and Frank A. Savage, 11 Shady Hill Square, Cambridge, Mass. 02138

Continuation-in-part of Ser. No. 495,683, Aug. 8, 1974, abandoned. This application July 15, 1975, Ser. No. 596,079

Int. Cl.² G10H *1/00*

U.S. Cl. 84—1.01 **3 Claims**



1. A device for producing a musical signal in response to a movement thereon comprising:

a. a support surface;

b. a cover surface disposed upon said support surface;

c. a current source;

d. a multiplicity of pressure-sensitive switching devices mounted in a predetermined pattern in said support surface in circuit with said current source;

e. at least one musical signal generating means adapted to produce a musical signal, said musical signal generating means having a series of input contacts which when current is delivered to an input contact, will cause an identified musical signal to be produced; and

f. a programmer in circuit with said pressure-sensitive switching devices and said at least one musical signal generating means permitting one or all of said pressure-sensitive switching devices to be placed in circuit with a particular input contact on said at least one musical signal generating means, said programmer being provided with terminals identified as to the characteristics of the musical signal to be produced when said pressure-sensitive switching devices are connected thereto and said pressure-sensitive switching devices are closed; further comprising:

g. electrical switching means adapted to change the musical signal which will be produced when a particular pressure-sensitive switching device is closed; said electrical switching means including a switch positioned in circuit with said current source and at least one relay in circuit with said switch, said relay placing at least one of said pressure-sensitive switching devices in circuit with one input contact on said sound generating means when said switch is open and placing said pressure-sensitive switching device in circuit with another input contact on said signal generating means when said switch is closed.

3,956,959

ELECTRONIC PERCUSSION INSTRUMENT

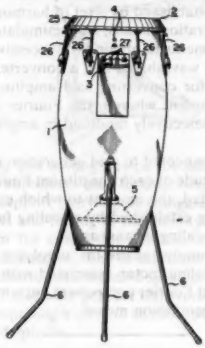
Tomoo Ebihara, Mooka, and Motonobu Serizawa, Mibu, both of Japan, assignors to Sanyo Silicon Electronics Co., Ltd., Mooka, Japan

Filed Feb. 20, 1975, Ser. No. 551,304

Claims priority, application Japan, Apr. 30, 1974, 49-49704[U]

Int. Cl.² G10H *1/02, 5/00*

U.S. Cl. 84—1.15 **7 Claims**



1. An electronic percussion instrument comprising:

a support plate;

a sensing element comprising a Hall element and means fixedly locating said Hall element on said support plate;

resilient means supported with respect to said support plate and extending laterally beyond said Hall element;

a beat plate overlying said Hall element and movably supported by said resilient means;

a magnet pendently secured to the underside of said beat plate near said Hall element and displaceable toward the Hall element by a beating force applied to said beat plate for causing a corresponding Hall element output;

an oscillator means for generating a sound signal like that of a percussion instrument upon being enabled by said output of said Hall element;

an amplifier means for amplifying an output sound signal from said oscillator means;

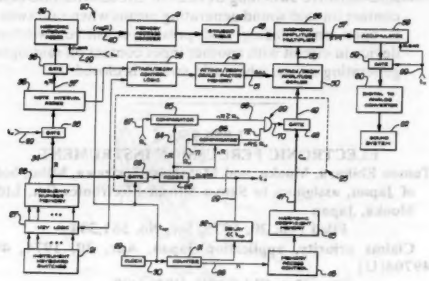
a speaker for converting the amplified sound signal from said amplifier means into the sound of such a percussion instrument.

3,956,960

FORMANT FILTERING IN A COMPUTOR ORGAN

Ralph Deutsch, Sherman Oaks, Calif., assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed July 25, 1974, Ser. No. 491,745
Int. Cl.² G10H 1/00, 5/00
U.S. Cl. 84—1.19 **29 Claims**



1. In an electronic musical instrument of the type wherein musical tones are synthesized in real time, said instrument having generation means for individually evaluating the constituent Fourier components of a musical waveshape, the relative amplitudes of said Fourier components with respect to each other being established by a set of harmonic coefficients stored in said generation means, an accumulator for accumulating these components to obtain the successive sample point amplitudes of said waveshape, and a converter connected to said accumulator for converting said amplitudes to musical tones, the improvement wherein the Fourier components of certain order are selectively modified in amplitude, comprising,

scaler means, connected to said generation means, for scaling the amplitude of each constituent Fourier component as it is evaluated, the amount to which each component is scaled being established by a scaling factor $F(n)$ supplied to said scaling means, and

scaling factor supply means for supplying to said scaler means that scaling factor associated with the order n of the constituent Fourier component currently being evaluated by said generation means.

3,956,961

PHASE-LOCK MULTIPLE TONE GENERATOR SYSTEM

Richard H. Peterson, 17748 Walnut Ridge Road, Palos Park, Ill. 60464

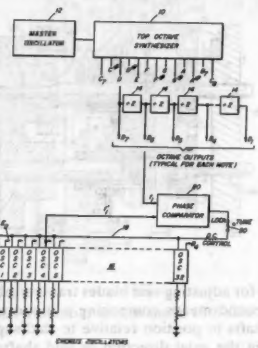
Continuation-in-part of Ser. No. 517,084, Oct. 23, 1974, abandoned. This application June 2, 1975, Ser. No. 583,188
Int. Cl.² G10H 1/02, 5/06
U.S. Cl. 84—1.24 **6 Claims**

1. Apparatus for providing chorus effects in an electronic musical instrument, the combination comprising:

first tone generator means for producing a plurality of output tones having frequencies corresponding to the notes of a musical scale,

second tone generator means for producing a plurality of output tones having frequencies corresponding to the notes of a musical scale, a selected one of which has a frequency integrally related to the frequency of a selected output tone produced by said first tone generator means, said second tone generator means being constructed such that the frequencies of its output tones vary differently with changes in environmental conditions than do the frequencies of the output tones of said first tone generator means, and being tunable in response to a control voltage to simultaneously vary the frequencies of its output tones over a limited range,

phase comparator means for comparing the phase of said selected tone produced by said first tone generator means with said selected tone produced by said second tone generator means for producing a varying D.C. control voltage having a polarity and amplitude proportional to the phase difference between the compared tones, and



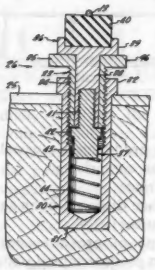
means for applying said control voltage to said second tone generator means to simultaneously and proportionally tune the output signal frequencies thereof in accordance with the analog control voltage by an amount to cause a phase lock between the selected tones from the first and second tone generator means.

3,956,962

GUITAR AND ADJUSTABLE MUTE THEREFOR

Grover G. Fields, Stanton, Calif., assignor to CBS Inc., New York, N.Y.

Filed June 20, 1975, Ser. No. 588,599
Int. Cl.² G10D 1/08
U.S. Cl. 84—267 **13 Claims**



1. In combination with a guitar having a plurality of spaced and general parallel strings mounted in tensioned relationship over a body, said strings lying generally in a plane substantially parallel to the face of said body, a plurality of individual mutes for said strings, each said mute comprising:

a mounting sleeve fixedly secured to said body beneath an individual one of the strings,

a shaft carried within said sleeve for rotatable adjustment along the axis of said sleeve,

a carrier assembly mounted to said shaft for rotaion about the axis of the shaft, and

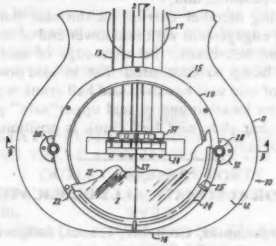
a damping pad mounted on the carrier assembly.

3,956,963

MUSICAL ATTACHMENT FOR GUITAR

John L. Milton, 554 - 55th St., Delta, British Columbia, Canada (V4M 3J7)

Filed Feb. 24, 1975, Ser. No. 552,137
Int. Cl.² G10D 3/02
U.S. Cl. 84—296 8 Claims



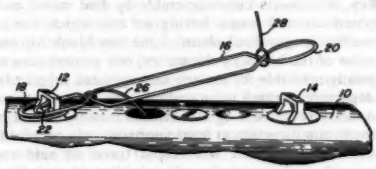
1. An attachment for a musical instrument having a sound box fitted with a bridge supporting strings near ends thereof; said attachment comprising a ring defining an opening, a resonator of sheet material secured to the ring and stretched taut across the opening, securing means for attaching the ring to the sound box to position the resonator above the bridge, a wire secured to the ring and extending across the opening beneath the resonator, and a bridge piece supported by the wire, said bridge piece having a first portion engaging the strings of the instrument and a second portion in contact with the resonator.

3,956,964

ARMING SYSTEM SAFETY DEVICE

Charles H. McGuire, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 349,521, April 9, 1973, Pat. No. 3,872,770. This application Oct. 10, 1974, Ser. No. 513,906
Int. Cl.² B64D 1/04
U.S. Cl. 89—1.5 D 4 Claims



1. An arming system safety device for an airborne weapon, said weapon having a plurality of mounting brackets engageable by a plurality of ejector hooks on an aircraft, said weapon being equipped with a fuze which is activated by pulling an arming lanyard upon release of the weapon from the aircraft; comprising:

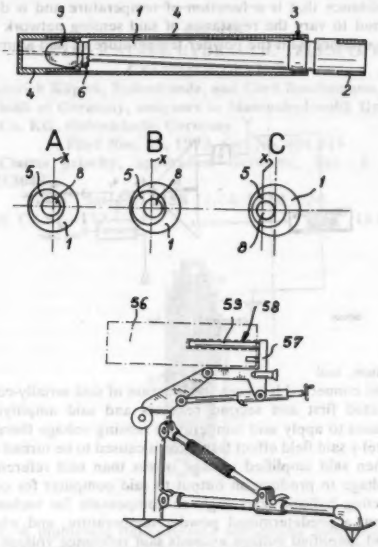
means for retaining said arming lanyard responsive to engagement of any one of said plurality of mounting brackets by any one of said plurality of ejector hooks.

3,956,965

EXCENTRIC SUPPORT SPINDLE

Maurice Rusbach, Vernier-Geneva, Switzerland, assignor to Sarmac S.A., Carouge, Geneva, Switzerland

Filed May 7, 1974, Ser. No. 467,809
Claims priority, application Switzerland, May 15, 1973, 6935/73
Int. Cl.² F41G 7/14
U.S. Cl. 89—41 A 11 Claims



1. Launching and aiming device for self-propelled projectiles housed in containers used as launching tubes, comprising an adjustable support carrying an elongated spindle fast with the said support and having in the vicinity of each of its ends an enlargement for contacting the inside wall of a guiding sleeve of a said container, one of said enlargements being fast with and concentric with the said spindle, and means to displace the other said enlargement transversely of said spindle, said means comprising a control shaft rotatable in a longitudinal bore of said spindle.

3,956,966

FAIL SAFE POWDER TEMPERATURE SENSOR FOR TANK FIRE CONTROL SYSTEM

William E. French, Hawthorne, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 26, 1974, Ser. No. 492,082
Int. Cl.² F41G 3/08
U.S. Cl. 89—41 ME 3 Claims

1. Apparatus for estimating powder temperature of ammunition contained within a tank by means of a temperature sensing network connected, in combination, with computer circuitry associated with said tank, said apparatus comprising

means for algebraically summing voltages received from said temperature sensing network and an input source, said input voltage being proportional to target range and said temperature sensing network voltage being proportional to said input voltage and said powder temperature,

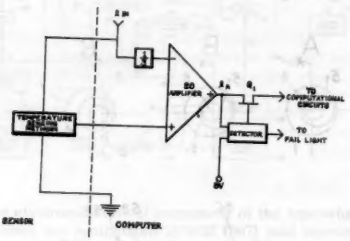
means for amplifying said summed voltages to produce an amplified voltage,

a field effect transistor connected between said computer circuitry and said amplifying means,

a detector having a predetermined reference voltage associated therewith and connected in circuit with said field

effect transistor,

said temperature sensing network comprising serially-connected first and second resistors, serially-connected third and fourth resistors, another field effect transistor having two terminals connected in series with said first and second serially-connected resistors, and a third terminal connected to the junction of said third and fourth serially-connected resistors, said another field effect transistor being a junction field effect transistor having a dynamic resistance that is a function of temperature and is disposed to vary the resistance of said sensing network in accordance with the powder temperature of said ammu-



nition, and

means connected between the junction of said serially-connected first and second resistors and said amplifying means to apply said temperature sensing voltage thereto wherel.y said field effect transistor is caused to be turned on when said amplified voltage is less than said reference voltage to produce an output to said computer for correcting ballistic lead angle to compensate for variance from a predetermined powder temperature, and when said amplified voltage exceeds said reference voltage to turn off said field effect transistor and to trigger a fail light.

3,956,967

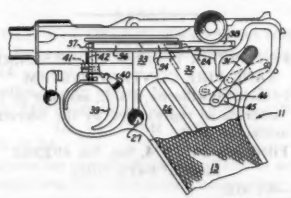
TOGGLE RELEASE FOR LUGER PISTOL

John V. Martz, Rte. 2, Box 380, Lincoln, Calif. 95648

Filed Jan. 31, 1975, Ser. No. 546,107

Int. Cl.² F41D *3/02*

U.S. Cl. 89—175 **3 Claims**



1. In a Model P.08 Luger pistol including a frame, a toggle assembly having a breech block, a hold open latch mechanism including a catch biased downwardly by a latch spring, the catch being movable between an upper projected position engageable with the breech block and a lower retracted position removed from the breech block, a magazine including a follower spring and a stud capable of moving the catch from lower retracted position into upper projected position when the magazine is empty, a sear bar slide, and a thumb safety lever pivotally connected with the sear bar slide for selective movement of the sear bar slide between a lower "fire" position and an upper "safe" position, a toggle release and trigger lock comprising:

a. an L-shaped bell crank including a generally horizontal fore and aft arm extending to a forward end overlying a portion of the catch and generally vertical leg extending downwardly to a lower end engageable with the after edge of the sear bar slide, said bell crank being fulcromed on said frame for rocking movement between a first location in which said forward end of said fore and aft arm imposes no force on the underlying catch portion and a second location in which said forward end biases the catch downwardly from said upper projected position to said lower retracted position wherein the breech block is released and the toggle assembly is free to move forwardy to closed position; and,

b. a camming member carried on the sear bar slide for camming engagement with said lower end of said vertical leg of said bell crank, the after edge of said camming member being so contoured that in said lower "fire" position of said sear bar slide said bell crank is positioned in said first location and in said upper "safe" position of said sear bar slide said bell crank is positioned in said second location.

3,956,968

MACHINE FOR AUTOMATICALLY DUPLICATING FLAT KEYS

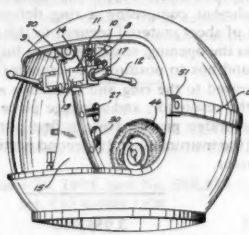
Serge Paul Crasnianski, Grenoble, France, assignor to Crasnianski France S.A., France

Filed Aug. 17, 1973, Ser. No. 389,214

Claims priority, application France, Sept. 13, 1972, 72.33197

Int. Cl.² B23C *1/16*

U.S. Cl. 90—13.05 **6 Claims**



1. A machine for automatically duplicating flat keys, comprising:

a. a fixed frame, a movable support having a top portion and being hinged to said frame for movement about a horizontal axis, two sets of jaw means mounted in parallel relationship on said top portion of said movable support for clamping respectively, a model key and a key blank, a feeler carried by said frame engageable by said model key, a motor, a cutter operable by said motor and disposed on said frame having an axis which lies in the median longitudinal plane of the key blank for engagement of the blank by the cutter, two control cam means jointly rotatable for moving said movable support from a departure position to an end position, in respective coordinated reciprocating movements namely a first movement in a direction at least approximately parallel to the axis of said cutter with rapid travel of said support towards said departure position while said model key and said key blank are respectively below said feeler and below said cutter, and with slow travel in the opposite direction during a milling operation, and a second movement in a direction perpendicular to said cutter axis to bring said model key against said feeler and said key blank against said cutter during the milling operation;

b. parallelogram-like linkage means movable by said control cam means to perform said coordinated movements of said movable support about said horizontal axis and for guiding said movable support in said coordinated movements, comprising a link and a longitudinally extensible rod unit, said link and rod unit being pivotally mounted

respectively, about relatively spaced axes on said frame to cause said movable support by rotation of said link in one direction to move perpendicularly to the axis of said cutter in a disengaging direction, and by longitudinal extension of said rod unit, to move parallel to the axis of said cutter in the direction corresponding to its slow travel; and

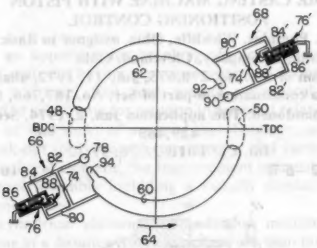
c. spring return means for resiliently biasing said movable support against both of said two control cam means while they move said linkage means to move said movable support in said slow travel of the first movement and said rapid travel of the second movement, said spring return means being arranged obliquely to the directions of said first and second movements and being interposed between said frame and said movable support for biasing said support towards said departure position.

3,956,969

HYDROSTATIC PUMP INCLUDING SEPARATE NOISE REDUCING VALVE ASSEMBLIES FOR ITS INLET AND OUTLET PRESSURE PORTS

Allyn J. Hein, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 9, 1974, Ser. No. 531,017
Int. Cl.² F01B 13/04
U.S. Cl. 91—6.5 4 Claims



1. In a cylinder head of a type suitable for mounting relative to a rotatable cylinder barrel of a reversible hydraulic pump suitable for use in a hydrostatic transmission, the cylinder barrel forming a plurality of bores for reciprocably mounting respective pistons, the cylinder head forming first and second pressure ports circumferentially arranged in a valve face of the cylinder head for periodic communication with the piston bores, the respective pressure ports containing either high or low pressure fluid depending upon the mode of operation for the translating unit, reciprocation of the pistons being timed in accordance with relative rotation between the cylinder head and the cylinder barrel, the improvement comprising a portion of the cylinder head forming a first restrictive orifice for communicating the first pressure port with the valve face of the cylinder head by means of a first port intermediate the first and second pressure ports, the first intermediate port being positioned for communication with each cylinder bore subsequent to its respective piston reaching a limit of reciprocation within the bore, the first restrictive orifice being selectively sized to control the rate of pressure equalization between each cylinder bore and the first pressure port, the cylinder head also forming a bore for receiving a first shuttle valve means arranged in parallel communication with the first restrictive orifice between the first pressure port and the first intermediate port on the valve face, the first shuttle valve means tending to close in response to a first relatively high pressure in the first pressure port, the cylinder head also forming a similar second restrictive orifice, and second shuttle valve means in parallel communication between the second pressure port and a second port intermediate the second and first pressure ports for communication with each cylinder bore just prior to its respective piston reaching an opposite limit of reciprocation within the bore and

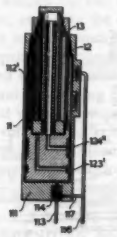
further comprising an additional restrictive orifice associated with each shuttle valve means for limiting fluid flow from the respective pressure port to which the shuttle valve means tends to be responsive and a bleed slot formed in communication with each pressure port for communication with each cylinder bore after communication of the cylinder bore with the respective intermediate port.

3,956,970

MULTIPLE STAGE HYDRAULIC TELESCOPIC CYLINDER DEVICE

Heinrich Küpiek, Holzwickede, and Gerd Brackemann, Unna, both of Germany, assignors to Montanhydraulik GmbH & Co. KG, Holzwickede, Germany

Filed Nov. 23, 1973, Ser. No. 408,819
Claims priority, application Germany, Nov. 2, 1971, 2253645
Int. Cl.² F15B 11/18; F01B 7/20
U.S. Cl. 91—173 11 Claims



1. A multistage fluid-pressure telescoping hydraulic cylinder arrangement comprising a cylinder member (**11**), a first hollow piston member (**12**) slidable in said cylinder member and having a bottom part and having a portion above the bottom part and a second hollow piston member (**13**) slidable in the first piston member and having an upper part and a bottom part, with a first annular space **112'** between the portion of the first piston member above the bottom part and the interior of the cylinder and a second annular space (**122'**) between the part of the second piston member above the bottom part thereof and the interior of the first piston member, first means (**113**) to supply pressure fluid to the interior of the cylinder member below the first piston member, a first connection (**123**) in the bottom part of the first piston member connected at a first end to the interior of the first hollow piston member below the second piston member and having its second end opening in the peripheral wall of the bottom part of the first piston member, and a first bypass means in the interior wall of the cylinder opposite the position of the second end of the first connection when the first piston member is in its fully raised position for connecting the interior of the cylinder through said first connection with the interior of the first hollow piston member below the second hollow piston member, whereby upon such supply of fluid the first hollow piston member moves to its fully raised position, whereafter the second hollow piston member is raised, a second connection (**124**) in the bottom part of the first piston having a first end opening into the second hollow piston member above the bottom thereof and having its second end opening in the peripheral wall of the bottom part of the first piston member at a point above the second end of the first connection, second fluid pressure supply means (**116**) opening through the cylinder wall at a point opposite the position of the second end of said second connection, when the first piston member is in its fully raised position and a second bypass means into which said second fluid pressure supply means opens in the interior

wall of the cylinder opposite the position of the second end of the second connection when the first piston member is in its fully raised position, there being a space between the second end of the second connection and the interior of the cylinder, said second bypass member bridging said last space during the retracting movement of the first piston member, whereby pressure fluid supplied to the interior of the second piston member through said second fluid pressure supply means causes said second piston means to retract and thereafter causes the first piston member to retract.

3,956,971

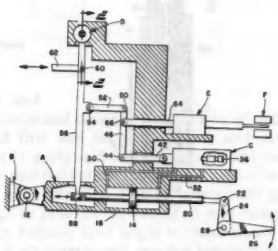
STABILIZED HYDROMECHANICAL SERVO SYSTEM

John W. Meulendyk, Kalamazoo, Mich., assignor to Pneumo Corporation, Boston, Mass.

Filed May 24, 1974, Ser. No. 473,134

Int. Cl.² F15B *13/16, 9/10*

U.S. Cl. 91—384 **17 Claims**



1. In a hydromechanical servo system, a hydraulic cylinder containing a piston, valve means for supplying fluid to said cylinder to actuate said piston, damping means for damping operation of said valve means, mechanical control means for operating said valve means, and mechanical feedback means connected between said piston, valve means and control means, the improvement comprising; limited motion yieldable means for providing limited yielding movement of said feedback means at predetermined frequencies prior to operation of said valve means by forces acting through said feedback means.

3,956,972

AXIAL PISTON PUMPS OR MOTORS

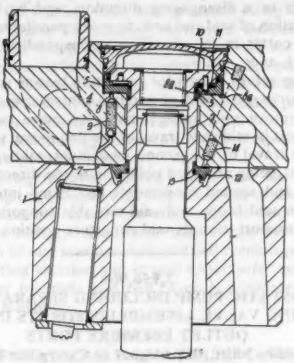
Robert Cecil Clerk, Edison House, Fullerton Road, Glenrothes, Fife, Scotland

Continuation of Ser. No. 370,375, June 15, 1973, abandoned. This application Nov. 13, 1974, Ser. No. 523,493

Int. Cl.² F01B *13/04*

U.S. Cl. 91—485 **9 Claims**

1. An axial piston pump/motor having a rotating barrel and a port-face and a casing embodying means for varying the clearance between the port-face and the rotating barrel comprising a first axially thrusting annular hydrostatic bearing located between a sleeve integral with said barrel and a first annular piston axially floating in a first annular cylinder in said casing and acting to force said barrel towards said port-face, said first bearing and said first annular cylinder being pressurized through a pressure reducer impedance by pump outlet



pressure, and acting in combination with means opposing the thrust of said first floating piston.

3,956,973

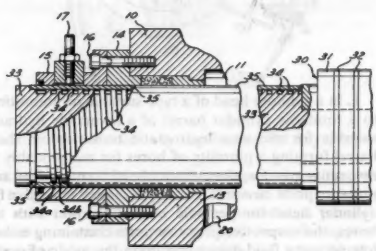
DIE CASTING MACHINE WITH PISTON POSITIONING CONTROL

Leonard J. Pomplas, Wickliffe, Ohio, assignor to Basic Aluminum Castings Company, Cleveland, Ohio

Continuation of Ser. No. 270,675, July 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 187,766, Oct. 8, 1971, abandoned. This application Jan. 2, 1974, Ser. No. 429,485

Int. Cl.² F01B *25/26, 31/12*

U.S. Cl. 92—5 R **10 Claims**



1. A cylinder and reciprocating piston combination, comprising:

a. a cylinder body defining a chamber and having an open end;

b. a piston movable in said chamber in response to a supply of pressurized fluid to said chamber;

c. a piston rod connected to said piston for movement therewith relative to said body and extending through said open end;

d. said piston rod being formed from a first magnetic material having a peripheral surface including a plurality of axially spaced groove portions said peripheral surface and said groove portions being covered by a second non-magnetic material which provides a smooth outer wear surface for said piston rod;

e. packing means carried by said body and forming a seal circumferential of said wear surface to inhibit the escape of pressurized fluid through said open end; and

f. transducer means positioned near said wear surface, said first and second materials cooperating to define a magnetic discontinuity means for cooperating with said trans-

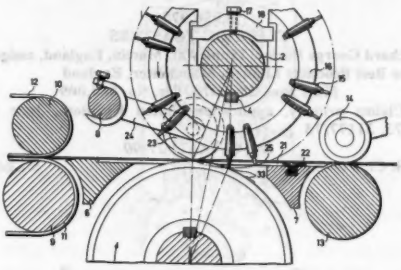
ducer means to produce electrical pulse signals for indicating the passage past said transducer means of one of the groove portions in said peripheral surface.

3,956,974

DEVICE FOR BREAKING OUT SCRAP PIECES FROM A PUNCHED SHEET

Friedrich Schröter, 3004 Isernhagen NB-Sud, AM Waldchem 8, Germany

Filed Apr. 26, 1974, Ser. No. 464,521
Int. Cl.² B26D 7/18
U.S. Cl. 93—36 A **4 Claims**



1. In an apparatus for breaking-out scrap pieces from a sheet of material having a pattern punched therein, and including a frame, first and second cylindrical elements mounted to said frame for rotation in opposed relation and for passage of said sheet of material therebetween, and at least one break-out tool assembly mounted to and carried by said first cylindrical element, the improvement comprising:

said tool assembly including a radially displaceable tool element; and

said cylindrical elements being further mounted to said frame at a distance from each other less than the sum of:

1. the radial distance from the center of said first cylindrical element to the distal end of said tool element in the radially extended position thereof, plus

2. the radius of said second cylindrical element,

said distance between and the relative mounting of said cylindrical elements being selected to cause said distal end of said tool element to be forced into firm gripped engagement with said scrap pieces, regardless of the thickness of said scrap pieces, before lateral displacement of said pieces, and said cylindrical elements further being mounted for a cooperative gripped displacement of said scrap pieces laterally of said sheet of material after firm gripping of said scrap pieces upon rotation of said cylindrical elements.

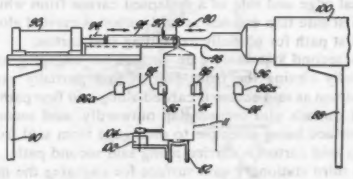
3,956,975

PACKAGING METHOD AND APPARATUS

Harry B. Egleston, Livonia; Robert E. Lisiecki, Orchard Lake; Duncan J. Crawford, Franklin; Eric A. Braun, Northville, and Earl W. Walke, Jr., Oak Park, all of Mich., assignors to Ex-Cell-O Corporation, Detroit, Mich.

Division of Ser. No. 420,427, Nov. 30, 1973, Pat. No. 3,905,280. This application Mar. 19, 1975, Ser. No. 559,848
Int. Cl.² B31B 1/66
U.S. Cl. 93—49 M **14 Claims**

1. A method of forming from a flat blank a container of the type having a tubular body with first and second end closures at opposite ends of the tubular body, the second end closure in its open position having a pair of spaced, upstanding panels, said method comprising: wrapping the container blank around a side seam mandrel with the side edges of the blank overlapping; engaging the outer surface of the overlapping edges with vibrating means having a vibrating frequency sufficient to weld the overlapping edges together to form a side seam on the container blank so that the container blank can be formed into tubular configuration; placing the tubular container blank on a first end closure mandrel with the first end closure in its open position projecting from said first end closure mandrel; folding said first end closure to a flat closed condition in overlapping layers against the first end closure mandrel; engaging the outer surface of the overlapping layers of the flat end closure with vibrating means having a frequency sufficient to weld the overlapping layers together; transferring the tubular container with the welded flat end closure to a second end closure welding station; engaging the outer surface of one of said upstanding panels with a mandrel and the outer surface of the other of said upstanding panels with vibrating means; moving said last named vibrating means and mandrel toward each other to close said upstanding panels together; and vibrating said last named vibrating means at a frequency capable of generating heat sufficient to weld together said upstanding panels and any layers of container materials sandwiched between said upstanding panels to close and seal said second end closure.

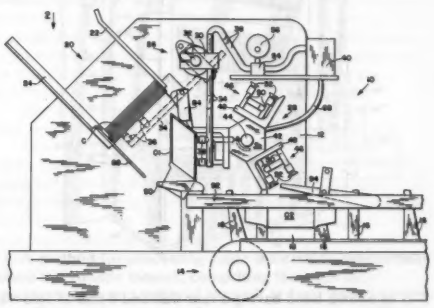


3,956,976

APPARATUS FOR EXPANDING AND TRANSFERRING A CARTON

Walter H. Vogel, Hoffman Estates, and Thomas E. Close, Joliet, both of Ill., assignors to Crompton & Knowles Corporation, Worcester, Mass.

Filed Oct. 4, 1974, Ser. No. 512,763
Int. Cl.² B31B 1/76
U.S. Cl. 93—53 SD **3 Claims**



1. In a packaging machine having a conveyor with spaced buckets for carrying expanded cartons and a magazine for holding a stack of collapsed cartons, said magazine having an opening therein for extracting said cartons from said machine, each of said cartons having flaps which lie in the same plane as the sides of the carton from which they extend and which comprise a first side flap, a second side flap, and a front flap including a tuck flap, said front flap extending beyond said side flaps and lying in the same plane as said first side flap, carton expanding and flap spreading means comprising:

a. first suction means for engaging and extracting from said stack a single carton through the opening in said maga-

zine and carrying said carton along a first path to a first point;

b. second suction means synchronized with said first suction means and said conveyor for engaging said carton at said first point and carrying said carton along a second path to a second point within a bucket on said conveyor;

c. control means for deactivating the suction of said first suction means upon engagement of said carton by said second suction means and for deactivating said second suction means when said carton reaches said second point;

d. a first stationary cam surface for engaging the longitudinal edge and side of a collapsed carton from which said first side flap extends as said carton is carried along said first path for partially expanding said carton;

e. a second stationary cam surface for engaging and partially closing the front flap of said partially expanded carton as said carton is carried along said first path so that it spreads said second flap outwardly, said second cam surface being effective to disengage from said front flap as said carton is carried along said second path;

f. a third stationary cam surface for engaging the inside of said second side flap before said front flat is disengaged from said second stationary cam and being effective after said front flap is disengaged from said second stationary cam to engage the inside surfaces of said first and front flaps and spread them outwardly as said carton is carried along said second path and by said conveyor; and

g. a fourth stationary cam surface for cooperating with said conveyor buckets and being effective to fully expand said carton within a conveyor bucket.

3,956,977

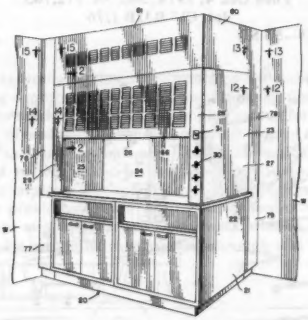
FUME HOOD WITH REMOVABLE ENCLOSURE PANELS

Michael Turko, Manitowoc, and David F. Huempfner, Kewaunee, both of Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Nov. 18, 1974, Ser. No. 524,571

Int. Cl.² F23J *11/00*

U.S. Cl. 98—115 LH **8 Claims**



1. In a fume hood having a rear wall and a pair of side walls providing a working chamber, a pair of generally vertically extending front corner posts for supporting the front ends of the side walls, a front access panel, a side enclosure panel, and attaching means for removably attaching the front access panel and the side enclosure panel to one of the front corner posts so that the attaching means are hidden from view from outside of the fume hood, said one corner post having a first vertically extending flange extending laterally outwardly therefrom and a second vertically extending flange extending forwardly therefrom, the side enclosure panel having a vertically extending front flange at the front edge extending inwardly parallel to the first flange of said one corner post, the attaching means including clip means removably securing the front flange of the side enclosure panel to the first flange of said corner post, the front access panel having a first vertically extending side flange extending rearwardly therefrom and a second vertically extending flange spaced laterally inwardly from the side flange and extending rearwardly parallel to the side flange and to the second flange of said one corner post, the attaching means including clip means removably securing the second flange of the front access panel to the second flange of said one corner post, the side flange and the second flange of the front access panel being spaced apart a distance sufficient to permit the side flange to extend substantially flush with the side enclosure panel.

3,956,978

ELECTRIC TOASTERS

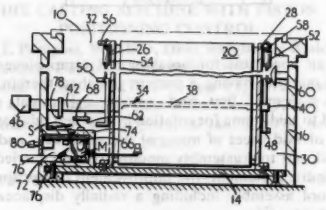
Richard George Borley, Trimley St. Martin, England, assignor to Best Products Limited, Manchester, England

Filed June 28, 1974, Ser. No. 484,009

Claims priority, application United Kingdom, June 29, 1973, 31177/73

Int. Cl.² A47J *27/00*

U.S. Cl. 99—329 R **5 Claims**

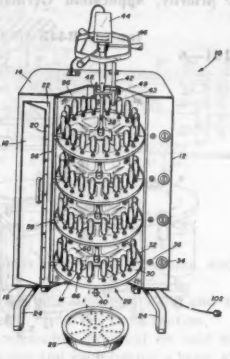


1. An electric toaster comprising a casing formed with an opening leading to an interior of the casing whereby a slice of bread to be toasted can be inserted into said interior, electrically energizable heater means mounted in the casing for applying bread toasting heat to the inserted slice, bread supporting means mounted in the casing for movement in opposite directions inwardly and outwardly of the casing, at least one element of ferro-magnetic material attached to the bread supporting means, spring means mounted in the casing and urging said bread supporting means in the direction outwardly of the casing, said bread supporting means being movable inwardly of the casing into a toasting position where the bread supporting means supports the slice alongside the heater means, electro-magnetic means mounted in the casing, said electro-magnetic means being energizable to generate a magnetic field exerting a holding attraction on said ferro-magnetic material for holding the bread supporting means in said toasting position, said electromagnetic means being de-energizable to terminate said magnetic field and release said bread supporting means from the toasting position by the force of said spring means, an electric circuit mounted in the casing, said circuit including the heater means, said electro-magnet means and switch means operable by the insertion of the slice for establishing a first current path through said heater means and a second current path through said electromagnet means, said switch means being operable for interrupting the supply of current to the circuit by the outward movement of the bread supporting means, and degree of toasting control means included in said circuit and operable for de-energizing said electro-magnet holding means upon the slice becoming toasted to a desired degree.

3,956,979
MULTI-ELEMENT VERTICAL ROTISSERIE

James H. Coroneos, Frederick and Thistle Roads, Baltimore, Md. 21228

Filed Jan. 24, 1975, Ser. No. 543,690
Int. Cl.² A47J 37/04
U.S. Cl. 99—421 V 16 Claims



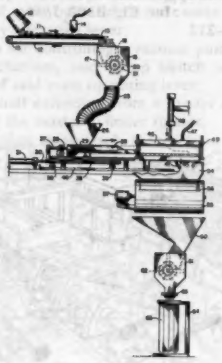
1. Rotisserie apparatus for cooking individual portions of a foodstuff, comprising:
body means;
heating means mounted on said body means;
spit means mounted for rotary movement on the body means;
platform means mounted on the spit means, the plane of said platform means being perpendicular to the longitudinal axis of the spit means, the platform means including disc-like members of two semi-circular half sections, which half sections make together about the spit means;
collar means fixedly carried on the spit means;
spring plate means carried on the spit means and opposing the collar means;
spring-based bolt means urging the collar means and spring plate means together, the half sections of the platform means fitting between the collar means and spring plate means on urging of the bolt means;
skewer means mounting said foodstuff portions about the periphery of the platform means;
means for rotating said skewer means on rotation of the spit means; and,
means for rotating the spit means relative to the heating means, thereby to evenly cook the foodstuff portions.

3,956,980
METHOD FOR PROCESSING REFUSE MATERIAL

Rush E. Lassiter, 1722 W. Thomas, Hammond, La. 70401

Continuation of Ser. No. 213,378, Dec. 29, 1971, abandoned.
This application Oct. 2, 1973, Ser. No. 402,823
Int. Cl.² B30B 15/34, 13/00
U.S. Cl. 100—38 17 Claims

1. A method for processing raw refuse material having a water content into a compressed, dried flake-like form having high nutrient content that will not readily absorb moisture from the atmosphere, said method comprising:
placing the raw refuse material between a pair of heated platens, said platens being disposed in movable relation one with the other;
forcing said platens together to compress said refuse material to a thin wafer-like form and maintaining said refuse material under compression for a predetermined period of time to heat and dry said refuse material the heat of said platens being sufficiently high to substantially destroy all of the bacteria contained within said refuse material while allowing said refuse material to retain substantially all of the nutrient content thereof;

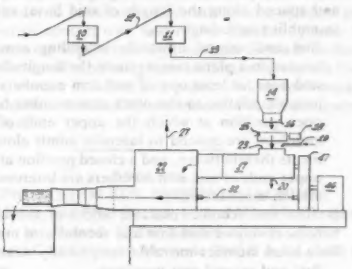


moving said platens apart; and
removing the compressed and dried refuse material from said platens.

3,956,981
METHOD FOR REFUSE DISPOSAL

Norman Pitt, Los Angeles, Calif., assignor to John N. Valianos, San Francisco, Calif.

Filed Jan. 29, 1974, Ser. No. 437,689
Int. Cl.² B30B 13/00
U.S. Cl. 100—39 6 Claims



1. A method for processing waste material to substantially reduce the volume thereof, comprising the steps of:
passing said waste material through at least one reduction mill to communicate said waste material into small particles;
feeding said comminuted waste material at a controlled rate to a blender;
blending said comminuted waste material to form an extrudable mass and maintaining the moisture content of said extrudable mass between about 15 and about 25% by weight of the extrudable mass; and
extruding said mass through a constricted die to compress said mass into a compact shape, the bore of said constricted die defining an outwardly tapered land adjacent the discharge end of said die whereby normal expansion of the compact shape after extrusion occurs prior to the discharge of the shape from said die.

3,956,982

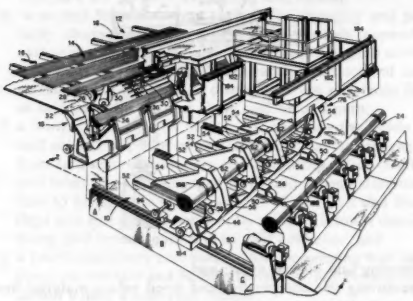
BUNDLE FORMING APPARATUS

William J. Hill, and William R. Wynn, both of Holden, Mass., assignors to Morgan Construction Company, Worcester, Mass.

Continuation of Ser. No. 346,632, March 30, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,135

Int. Cl.[2] B30B 5/04

U.S. Cl. 100—212 6 Claims



1. Apparatus for receiving elongated elements and for forming the same into a densely packed assembly, said apparatus comprising:

a. a base extending longitudinally in a direction parallel to the lengths of the elongated elements being handled;

b. a plurality of element receiving assemblies supported on and spaced along the length of said base, each of said assemblies including:

i. first and second upwardly extending arm members located in a plane transverse to the longitudinal axis of said base, at least one of said arm members being adjustable relative to the other arm member between an open position at which the upper ends of said arm members are spaced to laterally admit elongated elements therebetween, and a closed position at which the upper ends of said arm members are interconnected by a latch mechanism;

ii. first and second rotatable idlers at the upper ends respectively of said first and second arm members;

iii. a head member movable reciprocally relative to said first and second arm members;

iv. an elongated flexible restraining element extending from said head member over said first and second rotatable idlers and back to said head member, with the portion of said restraining element between said idlers forming a catenary extending between said first and second arm members;

c. first operating means for simultaneously adjusting the arm members of each element receiving assembly between said open position for receiving elements on said catenaries and said closed position preparatory to forming said elements into densely packed assemblies; and,

d. second operating means for simultaneously reciprocating the head members of said element receiving assemblies, movement of said head members in one direction causing said catenaries to be lengthened for receiving elongated elements thereon, and in the opposite direction for shortening said catenaries to form said elongated elements into tightly packed assemblies.

3,956,983

IMPRINTING ARRANGEMENT FOR THE MARKING OF CYLINDRICAL SAMPLE RECEPTACLES FOR SPECIMEN IDENTIFICATION

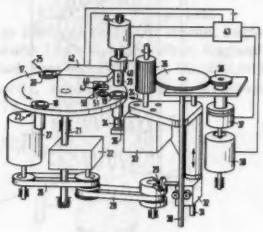
Werner Dittrich, and Werner Rauch, both of Nurnberg, Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Apr. 7, 1975, Ser. No. 565,606

Claims priority, application Germany, Apr. 20, 1974, 2419130

Int. Cl.[2] B44B 5/02

U.S. Cl. 101—6 2 Claims

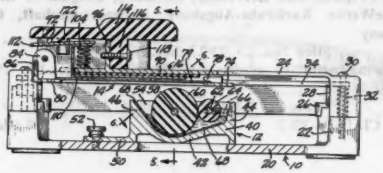


1. In an imprinting arrangement for the marking of cylindrical sample receptacles for specimen identification, said receptacles each having a specimen receiving portion, a portion of machine-readable encoded data for identifying the specimen, and a support portion serving as carrier of clear-text information correlated with said coded data; including holding means for supporting said sample receptacles and effecting their stepwise movement into a plurality of hold positions, one said position being a marking position; a marking arrangement associated with said marking position, said marking arrangement including receptacle-drive means adapted to be coupled with said sample receptacle located in the marking position thereof during the stationary operative phase of said holding means and being stepwise rotatable about its longitudinal axis through equal-remaining angular displacements conforming to the marking spacings on said receptacle, a punch arrangement for the application of said coded data on said receptacles; and printing means for imprinting the clear-text information on the support portion of said receptacle, said printing means including a plurality of singly selectable imprint dies, a printing magnet adapted to pass said currently selected imprint die during the stationary operative phase of the receptacle-drive means from a position of rest against the rim of the support portion of said receptacle; and control means for controlling the movements of the drive means for said holding means, receptacle-drive means, punch arrangement and printing means, the improvement comprising: said printing means comprising a printing roller, said imprint dies being distributed about the peripheral surface thereof and projecting radially outwardly, a rotatable shaft mounting said printing roller, said shaft being radially displaceable from a position of rest into an operative position directed towards the rotational axis of the receptacle being imprinted; a stepping motor; a non-slippable, elastic and radial displacement-symmetrical belt drive interconnecting said motor and said shaft for rotating said printing roller and selecting the respective imprint die; printing magnet means for imparting radial displacement to said shaft; heating means encompassing said printing roller in the position of rest of the latter for raising the temperature of said printing roller above the melting temperature of the receptacle material; and inked ribbon means controlled by said printing magnet means for conveying an inked ribbon between said printing roller and the rim of said receptacle for a distance conforming to the respective indicia width.

3,956,984
STENCIL PRINTER

John Chien Kuen Kiang, 53100 Juniper Road, South Bend, Ind. 46637

Filed Jan. 23, 1975, Ser. No. 543,248
Int. Cl.² B41L 13/02, 27/08
U.S. Cl. 101—124 5 Claims



1. In a stencil printer, in combination,
a frame
a shallow ink container carried by said frame, and open at its top
said container having side and end walls and a bottom whose top surface is of curved cross section,
bearing members releasably mounted on said side walls within said container and each having a bore, and
an inking roll having a shaft with projecting ends journaled in each bearing member bores to position said roller substantially concentrically with a portion of said curved bottom,
said bearing members conforming at their lower parts to the contour of said bottom and end wall surfaces and spaced slightly therefrom to define guide slots at opposite sides of said container,
and a flexible plastic sheet spanning the lower portion of said container and slidably retained in said guide slots.

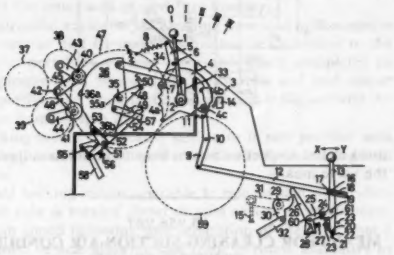
2. In a stencil printer, in combination,
a frame,
a stencil carrier shiftable and slidable on said frame,
a card carrier pivoted on said stencil carrier
said card carrier including a plate, a card retainer, a spring resiliently urging said retainer to retaining relation to said plate and a tripping lever, and
an abutment on said stencil carrier engageable by said tripping lever as said card carrier pivots toward open position to shift said lever and flex said retainer spring and shift said card retainer relative to said plate to a position to release a card.

3,956,985
OPERATING LEVER MECHANISM FOR OFFSET PRINTING PRESS

Koji Ishii, Fukuyama, Japan, assignor to Ryobi, Ltd., Hiroshima, Japan

Filed Nov. 18, 1974, Ser. No. 524,823
Claims priority, application Japan, Nov. 16, 1973, 48-128877
Int. Cl.² B41F 7/40
U.S. Cl. 101—142 9 Claims

1. In an offset printing press having a master cylinder, a rubber blanket cylinder, form rollers for inking the master cylinder, and a paper feed control mechanism for controlling the feeding of paper to the rubber blanket cylinder, the improvement comprising:
a main operating lever;
an operating shaft coupled to an end of said main operating lever and rotatable by said main operating lever;
a first cam plate coupled to said operating shaft and rotatable with said operating shaft about the axis of said shaft, said first cam plate having a paper feed control cam surface;
a cam following lever having means at one end riding against said paper feed control cam surface;
an auxiliary operating lever for activating the paper feed control mechanism;
an operating lever link having one end coupled to the other end of said cam following lever, and having its other end coupled to said auxiliary operating lever so that movement of said main operating lever causes movement of said auxiliary operating lever;
a pump switch for controlling a vacuum pump of the feed control mechanism, said pump switch actuatable by movement of said main operating lever;
an eccentric shaft extending from a master cylinder shaft about which the master cylinder rotates;
a second cam plate transversely spaced from said first cam plate and pivotally coupled to said master cylinder shaft,



said second cam plate having a form rollers actuating cam surface and a master cylinder separating cam surface;
a link and arm combination coupled between an outer portion of said second cam plate and said operating shaft so that said second cam plate rotates about said master cylinder shaft when said operating shaft rotates;
a cam follower and form roller link coupling said actuating cam surface to the form rollers; and
a cam follower latching means for following said master cylinder separating cam surface and coupled to said master cylinder to selectively move said master cylinder into and out of contact with said rubber blanket cylinder by the camming action between said cam follower latching means and said separating cam surface; whereby the form rollers, master cylinder, and paper feed control mechanism can be controlled by movement of said main operating lever.

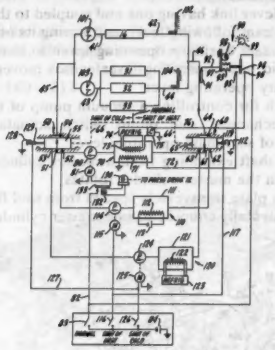
3,956,986
INKING SYSTEM FOR PRINTING MACHINES

Burkhardt Wirz, and Peter Decker, both of Munich, Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG and Grapho Metronic GmbH & Co., both of, Germany

Filed Dec. 4, 1974, Ser. No. 529,526
Claims priority, application Germany, Dec. 5, 1973, 2360611
Int. Cl.² B41F 31/00
U.S. Cl. 101—350 15 Claims

1. In an inking system for applying ink to a printing plate in a printing press, the combination comprising a fountain including a fountain roller, a series of ink feed rollers including at least one vibrated roller, the fountain roller and vibrated roller being of hollow metallic construction having fluid supply and return lines, a fluid reservoir having an alternatively energizable source of heat and source of cold, a pump for pumping fluid through the supply and return lines, regulator means for correctively energizing the source of heat and source of cold to maintain a predetermined temperature condition in the rollers, means including an adjustable throttling valve means for dividing the fluid flow in predetermined ratio between the fountain roller and vibrated roller so that the

temperature at each of the rollers is maintained at a predetermined relative level, and means for indicating the temperatures in the respective return lines to facilitate adjustment of the valve means.



3,956,987
MEANS FOR CLEANING SUCTION AIR CONDUITS ON PRINTING PRESSES

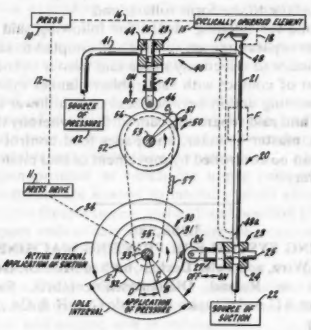
Hans Alix, Offenbach, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Filed Sept. 30, 1974, Ser. No. 510,468

Claims priority, application Germany, Oct. 3, 1973, 2349557

Int. Cl.² B41F 35/00

U.S. Cl. 101—425 **1 Claim**



1. In a suction system for a printing press having a dusty environment, the combination comprising a press drive for driving a press including a cyclically operated suction-requiring element, a suction line, a source of suction at one end of the line, a suction head at the other end of the line open to ambient air and associated with the suction requiring element, a suction valve interposed between the source of suction and the suction line, a suction valve operator coupled to the press drive for cyclically opening the suction valve for applying suction at the element during active intervals and for closing the suction valve during intervening idle intervals, a pressure line, a source of high pressure air at one end of the pressure line, the other end of the pressure line being connected to the suction line, a pressure valve interposed between the source of pressure and the pressure line, a pressure valve operator, and an integral step-down drive connection connected between the suction valve operator and the pressure valve operator for opening the pressure valve momentarily to provide a high velocity reversely flowing shot of air well within the idle interval between a predetermined integral number of active intervals of the suction valve.

3,956,988
POSITION-INDEPENDENT MINE CONSTRUCTION

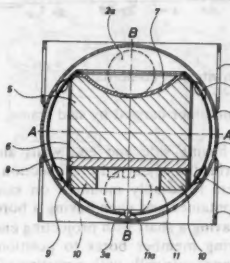
Otto Pecksen, Bad Herrenalb, Germany, assignor to IndustrieWerke Karisruhe-Augsburg Aktiengesellschaft, Germany

Filed Jan. 29, 1973, Ser. No. 329,230

Claims priority, application Germany, Feb. 19, 1972, 2207840

Int. Cl.² F42B 23/06; F42C 11/02

U.S. Cl. 102—19.2 **9 Claims**



1. A position-independent dispersable land mine, in particular a hollow charge mine for combatting wheeled and tracked vehicles, especially armored vehicles, comprising a body of revolution, a first closed hollow spherical member located within said body of revolution and secured thereto, a second hollow spherical member located within said first hollow spherical member, means supporting said second hollow spherical member for relative rotation in respect to said first hollow spherical member, a hollow charge mounted within said second hollow spherical member having a hollow charge cavity adapted to be oriented with its axis substantially vertically, and means in said second spherical member for maintaining said second spherical member with said hollow charge in a predetermined orientation in which said hollow charge cavity axis is substantially vertical.

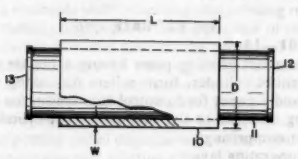
3,956,989
FRAGMENTATION DEVICE

Charles E. Sallade, Cinnaminson, N.J., and James D. Nicolo, Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 8, 1966, Ser. No. 601,291

Int. Cl.² F42B 13/18, 13/48

U.S. Cl. 102—67 **1 Claim**

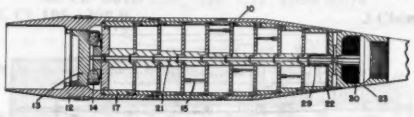


1. A high explosive device of the projectile type having a wall of wrought steel of hypoeutectoid composition consisting exclusively of a discontinuous, balanced ferrite-untempered martensite microstructure for improved fragmentation effects.

3,956,990
BEEHIVE PROJECTILE

John F. Rowe, Dover, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 31, 1964, Ser. No. 387,557
Int. Cl.² F42B *13/50*
U.S. Cl. 102—69 5 Claims



1. Anti-personnel ammunition capable of direct and indirect fire comprising

a body having a nose end and a base end

an explosive charge positioned within said body adjacent its base end

a multiplicity of anti-personnel fin stabilized flechettes within said body arranged in at least one layer between said explosive charge and said nose end

means positioned centrally in said body and along a longitudinal axis of said body extending from a point adjacent said explosive charge to a point adjacent said body nose end and having a passageway therethrough for conducting an ignition flash to said explosive charge

timer fuzing means adjustable for substantially immediate action in one position and for delayed action in other positions

adapter means for assembling said fuzing means to said body nose end

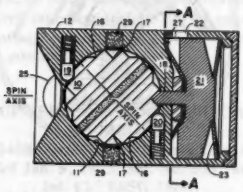
relay explosive means positioned between said fuzing means and said ignition flash conducting means, and

a plurality of detonators in said adapter means and positioned radially of and in spaced relation to said relay explosive means, said adapter means having lateral passage means communicatively interconnecting said detonators and relay explosive means.

3,956,991
OPTICAL, SEMI-ACTIVE BOMBLET FUZE

James E. Means, Corona, and Matthew E. Anderson, Ontario, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 3, 1968, Ser. No. 765,749
Int. Cl.² F42C *13/02*
U.S. Cl. 102—70.2 P 5 Claims



1. A proximity fuze for submunitions primarily initiated from high-intensity light sources whose wavelength is of a select bandwidth, comprising,

a. a cylindrical fuze housing whose spin axis coincides with the cylinder axis,

b. a spherical chamber in a forward portion of said housing along said spin axis,

c. an opening between the forward end of said housing and said spherical chamber,

d. an optical lens means mounted in said opening for focusing and concentrating high-intensity light of select bandwidth from an external source to a point just within said chamber,

e. a gyro rotor having a diameter slightly less than the diameter of said spherical chamber and operable to slideably rotate therein to align its spin axis with the spin axis of said fuze housing,

f. a passage through said rotor along its spin axis,

g. a light-sensitive explosive detonator contained in said rotor passage at its forward end,

h. an inertially actuated stab-detent means mounted in a rearward portion of said fuze housing,

i. a stab-sensitive explosive detonator contained in said rotor passage at its rearward end,

j. an output explosive lead between said spherical chamber and the outer wall of said fuze housing,

k. a torroidal explosive lead leading from said light-sensitive detonator and from said stab-sensitive detonator to the outer periphery of said rotor and which completes an explosive train between said detonators and said output explosive lead when said rotor spin axis is aligned with the fuze housing spin axis,

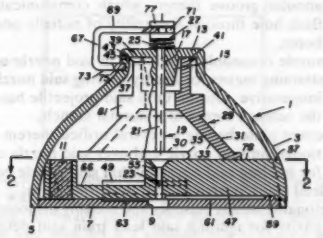
l. locking means for locking said rotor in safe position with its spin axis out of alignment with the fuze housing spin axis,

m. said locking means operable to release said rotor when said fuze is rotated about its spin axis at a certain minimum speed following safe separation of the fuze from a launch vehicle allowing said rotor to rotate and move to armed position aligning its spin axis with that of said fuze, thus aligning said light-sensitive explosive detonator with said optical lens means and said stab-sensitive explosive detonator with said stab detent means and then locking said rotor in armed position when the rotation of said fuze about its spin axis is reduced below said minimum speed, wherein when in armed position a concentration of high-intensity light of proper bandwidth focused onto the forward end of said light-sensitive explosive detonator by said optical means will result in detonation thereof and wherein head-on impact will cause said stab-detent means to stab said stab-sensitive explosive detonator resulting in detonation thereof.

3,956,992
WIDE-ANGLE INERTIAL IMPACT FUZE

Michael T. Tari, Newton, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 1, 1974, Ser. No. 493,954
Int. Cl.² F42C *15/22, 1/00, 15/26*
U.S. Cl. 102—73 A 9 Claims



1. An inertial, wide-angle, impact fuze, comprising:

an open cup-shaped housing including a rear end adapted to be attached to an explosive projectile and a closed front end having an axial bore;

a percussion-type detonator disposed in said housing in alignment with said bore;

a firing pin, of relatively small mass, for initiating said detonator, slidably mounted in said bore, and having a circular flange;

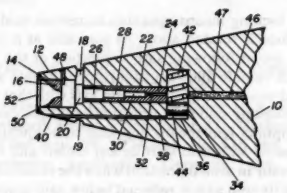
means for maintaining said firing pin spaced axially from said detonator in armed condition prior to impact; and

an annular inertial actuator, of relatively large mass compared to said firing pin, completely within said housing, comprising a rear portion having an internal conical surface surrounding said firing pin flange and adapted to shift laterally by inertia on graze impact of said fuze with a target to engage the periphery of said flange and drive said firing pin into said detonator.

3,956,993
FLUID EXPLOSIVE INITIATOR

Anthony P. Corrado, Totowa Boro, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 8, 1974, Ser. No. 522,155
Int. Cl.² F42C *5/00*
U.S. Cl. 102—81 **3 Claims**



1. A fluid explosive initiator for safing and arming a projectile which comprises:

a fuze body having a conically shaped forward open nozzle end, said open nozzle end having an axially positioned nozzle counterbore therein which communicates with an axially aligned flash hole of smaller diameter than said nozzle counterbore, said flash hole communicates with an axially positioned resonance tube body bore, said body bore communicates with a transversely positioned, tubularly shaped detonator slide cavity, said slide cavity communicating with an axially positioned lead train bore, said slide cavity being connected on one end to a longitudinally positioned air passageway which has an input orifice positioned near said nozzle end, said nozzle end having an annular groove therein which communicates with said flash hole through a plurality of radially positioned vent bores;

a nozzle releasably positioned in said nozzle counterbore;

restraining means for fixedly holding said nozzle in a "safe" inoperative position until said projectile has experienced the setback forces of a normal launch;

a cover plate having a central orifice therein fixedly positioned on said nozzle end over said nozzle coounterbore for holding said nozzle within said nozzle counterbore;

a lead train located in said lead train bore;

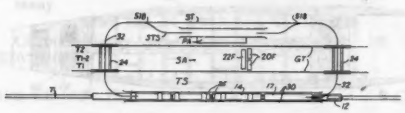
detonator means biasedly and slidably disposed in said slide cavity for igniting said lead train said detonator means being biasedly held in a "safe" out-of-line position prior to projectile launch and being moved to an in-line "armed" position when said projectile has been launched; and

fluid heat generating means for igniting said detonator means when said projectile velocity has increased sufficiently to move said detonator means from said out-of-line "safe" position to said in-line "armed" position.

3,956,994
CONTAINER OVERHEAD TRANSFER AND STORAGE SYSTEM

Leonard D. Barry, 19300 Pennington Drive, Detroit, Mich. 48221

Filed July 5, 1972, Ser. No. 269,239
Int. Cl.² B61J *3/00*
U.S. Cl. 104—88 **27 Claims**

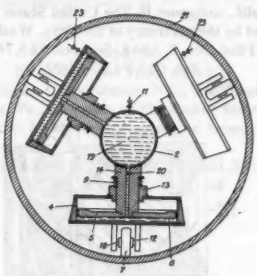


1. A container transfer system having containers, a railway track, a train on said track, at least one car in said train having an open container area for at least one of said containers, a suspended station track parallel over said railway track for a transfer run at least one carrier on said track having a frame and outboard support wheel means on each end of said frame for suspending said carrier to move along said station track, vertical depending coupling means extending down from said carrier, vertical coupling means on said car extensible to engage said depending coupling means for coupling said carrier when aligned thereabove to telescope therein, means on said frame and on said containers for engaging and suspending any one or more of said containers thereto, and dip and return slopes one for each said wheel means for lowering and lifting said frame substantially level over said car so coupled and moving along said run.

3,956,995
METHOD AND APPARATUS FOR MAINTAINING THE AXIAL ALIGNMENT BETWEEN A TUBE AND A MACHINE MOVABLE THEREIN

Michel G. Lecordier, "Le Parc" -Blvd. Pomeon, 13009 Marseille, France

Filed Nov. 7, 1974, Ser. No. 521,830
Claims priority, application France, Nov. 7, 1973, 73.39501
Int. Cl.² B61B *13/10*
U.S. Cl. 104—138 G **13 Claims**



5. A device for maintaining the level of the axis of a machine relative to the axis of a tube in which the machine moves, comprising, a weight compensation device having a closed chamber for liquid and having an axis oriented parallel to the axis of the tube; at least three movable cylinders whose axes entend radially of said chamber; a piston located in each of said movable cylinders and slidable with respect thereto; at least three piston rods fixed to said chamber and said pistons, and each slidable in one of said movable cylinders, said piston rods having a passage therethrough to communicate said chamber with one side of said piston; said piston rods and cylinders being equally angularly spaced apart, at least one

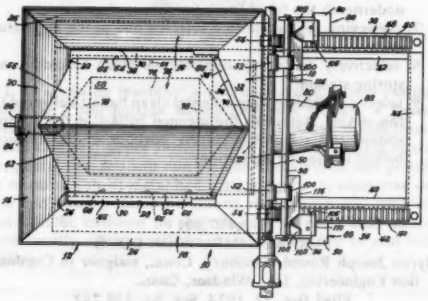
roller attached to each of said movable cylinders and bearing against the wall of the tube; and means for supporting a machine centered on said axis of said chamber.

3,956,996

PIVOTED SLIDE GATE LOCK

Robert T. Fischer, Homewood, Ill., assignor to Miner Enterprises, Inc., Chicago, Ill.

Filed June 14, 1974, Ser. No. 479,216
Int. Cl.² B61D *7/20, 7/26, 7/32;* **E05B** *65/14*
U.S. Cl. 105—308 B **3 Claims**



1. For use in a hopper outlet assembly including frame means with a generally rectangular main frame having a front frame section and a rear frame section and side frame sections defining a discharge opening through which lading can flow by gravity, a generally rectangular gate slidably supported in the frame means, and a transverse operating shaft rotatably carried by the gate adjacent the rear portion thereof for selectively moving the gate forwardly and rearwardly between open and closed positions relative to the discharge opening, lock means comprising a stop member secured to the frame means rearwardly of the rear frame section and presenting a bearing surface which faces forwardly, a transverse lock shaft rotatably carried by the gate parallel to the operating shaft rearwardly thereof, a radially extending cam plate sector secured to said lock shaft in longitudinal alignment with said bearing surface and presenting an arcuate cam surface, said cam plate sector normally being rotatably in one direction to pivot said cam surface into engagement with said bearing surface when the gate is in its fully closed position to block movement of the gate away from its fully closed position, an abutment member secured to said cam plate sector and being engageable with said stop member for limiting the extend of engagement of said cam surface with said bearing surface, and said cam plate sector being inactivated by rotation in the other direction to pivot said cam surface out of engagement with said bearing surface to permit movement of the gate away from its closed position.

3,956,997

DRIVE-UP TELLER WINDOW PROTECTION APPARATUS

B. Mike Hall, 2408 Geraldine, Oklahoma City, Okla. 73107

Filed Jan. 9, 1975, Ser. No. 539,726
Int. Cl.² E05G *5/00*
U.S. Cl. 109—20 **12 Claims**

1. In a protective construction for use with a drive-up window in a first wall having inner and outer sides and having a teller's counter spaced inwardly from the inner side of the wall, the improvement comprising:

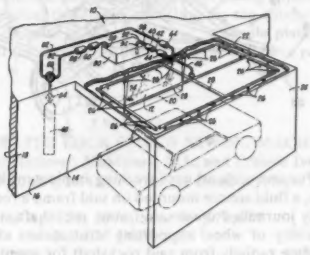
a second wall spaced from the outer side of the first wall a distance sufficient to allow passage of an automobile therebetween;

a roof structure extending between said first and second walls above the drive-up window and positioned a vertical distance above the ground sufficient to allow passage of an automobile thereunder;

a plurality of downwardly directed nozzles mounted in said roof structure in spaced relation, said nozzles being aligned such that fluid streams emanating therefrom impinge on the windshield and windows of an automobile positioned thereunder adjacent the drive-up window;

fluid distribution system means for communicating with said nozzle;

fluid reservoir means for communicating with said fluid distribution system means;



liquid chemical agent means disposed within said fluid reservoir means for passing through said fluid distribution system means and said nozzles and forming fluid streams emanating from said nozzles and impinging on the windshield and windows of an automobile to obscure vision therethrough and mark the automobile for identification;

means for applying pressure to said fluid reservoir means to pass said liquid chemical agent means from said reservoir means and through said fluid distribution system means and said nozzles; and

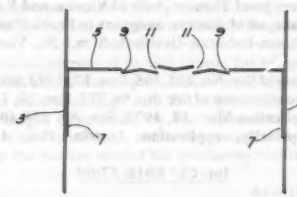
control means for alternately permitting and preventing the application of pressure by said means for applying pressure in response to control signals applied thereto.

3,956,998

FURNACE WALL ASSEMBLY HAVING REDUCED THERMAL CONDUCTIVITY

James W. Bavetz, 3535 Dayton Road, Madison, Ohio 44057

Filed Aug. 6, 1975, Ser. No. 602,246
Int. Cl.² F23M *5/00*
U.S. Cl. 110—1 A **2 Claims**



1. In a furnace wall assembly comprising an inner wall panel and an outer wall panel spaced apart by at least one structurally supporting, thermally conductive member, the improvement wherein said member is a substantially U-shaped metal channel, the base of the U-shaped channel having therein at least three rows of longitudinally disposed slits, the slits in each row being in staggered relation with respect to the slits in the next adjacent row and the metal on at least one side of each slit being displaced with respect to the plane formed by the channel base.

3,956,999

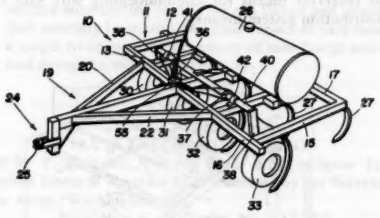
EARTHWORKING IMPLEMENT WITH AUTOMATIC FLUID FLOW SHUT-OFF MANIFOLD

J. L. English, Tell City, Ind., assignor to Chem-Farm, Inc., Evansville, Ind.

Filed Dec. 19, 1974, Ser. No. 534,437

Int. Cl.² A01C *23/02*

U.S. Cl. 111—7 **4 Claims**



1. For use with an earthworking implement having a rigid frame, a fluid source mounted on said frame a rockshaft transversely journalled upon said frame, rockshaft moving means, a plurality of wheel supporting strut means affixed to and extending radially from said rockshaft for angular movement with the rockshaft relative to the frame from a transport position to a work position, fluid dispensing manifold valve means mounted on the frame, the valve means including housing means having an inlet port connected to said fluid source, stem means movable into and out of the housing means, and a valve plate connected to the stem means and movable past the inlet port to adjust a flow of fluid, the apparatus further including bi-ended interconnector means at one end engaging the surface of the rockshaft so as to be wrapped around at least a part of the rockshaft surface, bi-ended safety spring means connected at one end to the remaining interconnector end and at its other spring end connected directly to the valve stem means, angular motion of the rockshaft and wheel-supporting struts between the transport position and the work position causing the one interconnector end to wrap and unwrap around the rockshaft surface and causing the other interconnector end and tensioned safety spring means to move the valve stem partially into and out of the valve housing, thereby moving the valve plate past the valve inlet port and prohibiting and permitting fluid flow through the valve without accidentally overtensioning the interconnector means and the valve stem.

3,957,000

BALLAST TREATING METHOD

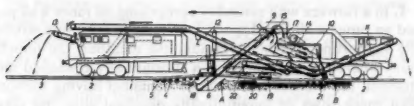
Franz Plasser; Josef Theurer, both of Vienna, and Karl Fölser, Linz-Urfahr, all of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H., Vienna, Austria

Continuation of Ser. No. 425,165, Dec. 17, 1973, abandoned, which is a continuation of Ser. No. 96,773, Dec. 10, 1970. This application Mar. 14, 1975, Ser. No. 558,409

Claims priority, application Austria, Dec. 18, 1969, 11774/69

Int. Cl.² E01B *27/00*

U.S. Cl. 171—16 **4 Claims**



1. A method of treating ballast with an apparatus moving on a track including rails fixed to ties resting on a ballast bed and defining cribs therebetween, comprising the steps of

1. lifting a section of the track between a forward and a rear end of the apparatus;
2. removing ballast from the bed underneath the lifted track section;
3. conveying the removed ballast to a ballast cleaning station;
4. cleaning the removed ballast at the cleaning station to separate the removed ballast into cleaned ballast and rubble;
5. conveying the cleaned ballast from the cleaning station in a conveying path to a storing station;
6. selectively depositing portions of the cleaned ballast in a crib remote from the lifted track section and in the bed underneath the lifted track section;
7. conveying the rubble to a selected one of the apparatus ends;
8. selectively delivering supplemental clean ballast to the storing station;
9. selectively adding supplemental clean ballast delivered to the storing station to the cleaned ballast at the storing station and selectively storing portions of the cleaned ballast at the storing station.

3,957,001

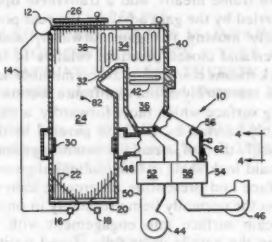
FURNACE IMPLOSION DOOR

Byron Joseph Round, Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 23, 1974, Ser. No. 535,742

Int. Cl.² F23M *7/00*; F23N *5/24*

U.S. Cl. 110—173 B **7 Claims**



1. In a balanced draft vapor generator organization including a furnace chamber in which fuel is burned for the generation of combustion gases, means forming a passage communicating with said furnace chamber for the discharge of combustion gases therefrom, a forced draft fan operative to supply air for combustion to said furnace chamber, and an induced draft fan operative in said passage to induce flow of combustion gases therethrough, the improvement comprising means for alleviating the effects of an excessive negative fluid pressure in said furnace chamber, said means including:

a. a through opening in the wall of said passage-forming means communicating with an external souce of air and disposed in said organization intermediate, in the gas flow sense, said forced and induced draft fans;

b. a releasable closure door for said opening operatively attached to said passage-forming means to open inwardly into said passage, and

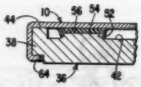
c. means retaining said door normally closed and operative to release the same for opening upon the occurrence of a predetermined excessive negative pressure in said furnace chamber.

3,957,002

BED COVER FOR A SEWING MACHINE

Giancarlo Della Torre, Milan, Italy, assignor to The Singer Company, New York, N.Y.

Filed Sept. 29, 1975, Ser. No. 617,769
Claims priority, application Italy, Apr. 30, 1975, 22915/75
Int. Cl.² D05B 75/00
U.S. Cl. 112—258 4 Claims



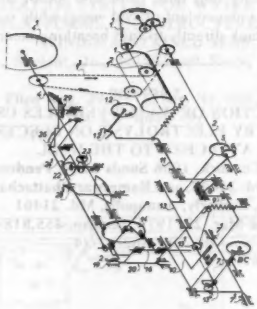
1. In a sewing machine, a bed comprising: a bed casting including a top portion having an upper surface, a raised peripheral rim on said upper surface, a plurality of pads interspersed on said upper surface below the level of said raised peripheral rim; resilient non-metallic cushions on said plurality of pads; a sheet metal bed casting top cover supported on said bed casting raised peripheral rim and on said resilient non-metallic cushions on said plurality of pads; and, means permanently affixing said sheet metal top cover to said bed casting.

3,957,003

SIMPLIFIED CONTROL MECHANISMS FOR SEWING MACHINES

Georges Drevet, 24 rue Francisque Voytier, 42100 Saint-Etienne-Loire, France

Filed Apr. 10, 1974, Ser. No. 459,683
Claims priority, application France, Apr. 13, 1973, 73.14268
Int. Cl. D05b 3/02
U.S. Cl. 112—158 R 15 Claims



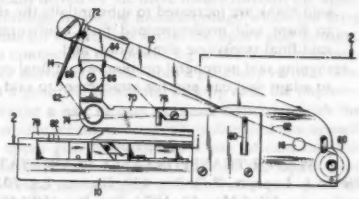
1. In a zig-zag sewing machine having a hook or looper, a fabric feeding dog or latch and a needle bar, a control mechanism for the synchronized operation of the hook, the fabric feeding latch and the needle bar of the sewing machine, said mechanism comprising a main drive shaft, two juxtaposed eccentrics driven by said main drive shaft, first means including a cam drivingly connecting one eccentric to the hook for imparting oscillatory movement thereto, second means drivingly connecting the second eccentric to the fabric feeding latch for imparting oscillatory movement to the fabric feeding latch which is synchronized with the oscillatory movement of the hook, said second means including adjustable means for adjusting both (a) the stroke of the feeding latch and thereby stitch length, and (b) the direction of oscillation of the feeding latch and thereby the direction of displacement of the fabric, third means drivingly connecting the main drive shaft and the needle bar for imparting rising and falling movement thereto, said third means including a driven crank, an eccentric pin on said crank controlling rising and falling movement of said needle bar, a slide block connected to said eccentric pin, a thread tensioning lever sliding without play in said slide block, and an adjustable support pivotably supporting said lever; a needle bar support having first and second support pivots about which the needle bar support is rotatable, one of said pivots being supported on said adjustable support, means adjustably supporting said adjustable support for translation movement for aligning said first and second support pivots, fourth means drivingly connecting said main drive shaft and said needle bar support for oscillating said needle bar to produce zig-zag stitches, said fourth means including adjustment means for adjusting the amplitude of the zig-zag stitches and the centered position of the needle bar, a needle plate, and fifth means for fixedly supporting said needle plate in a particular position.

3,957,004

HAND-OPERATED LOCK STITCH SEWING MACHINE

Stanley Joseph Ketterer, Middlesex, N.J., and Francis Ivanko, Columbia, Pa., assignors to The Singer Company, New York, N.Y.

Filed Apr. 25, 1975, Ser. No. 571,679
Int. Cl.² D05B 1/00
U.S. Cl. 112—169 6 Claims



1. In a hand stitcher having a frame;
a throat plate adjacent a first end of said frame;
a needle carrier pivotally connected at one end to the second end of said main frame and supporting a thread carrying eye pointed needle at the opposite end;
a thread cutter positioned at a predetermined distance from said eye pointed needle;
a shuttle carrier slideably mounted within said frame and geared to move toward and away from said throat plate upon respectively depressing and raising said needle carrier;
and a boat-type shuttle loosely confined within a cage connected to the shuttle carrier, the improvement comprising:
holding means connected to said shuttle for trapping the leg of the thread loop thrown by the needle upon the first depression of the needle through said throat plate whereby thread, having a length determined by the distance of said thread cutter from said needle eye, is drawn beneath said throat plate to provide the bottom thread for producing lockstitches.

3,957,005

METHOD FOR MAKING A METAL CAN END

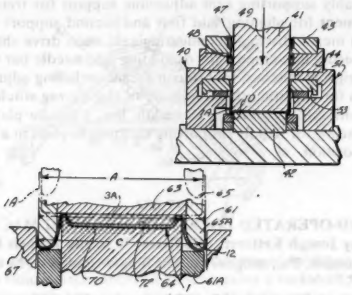
Robert E. Heffner, Lower Burrell, Pa., assignor to Aluminum Company of America, Alcoa Center, Pa.

Filed June 3, 1974, Ser. No. 475,442
Int. Cl.² B21D 51/44, 22/21
U.S. Cl. 113—1 F 22 Claims

1. A method for making a can end for attachment to a can body, comprising
forming a blank defined by a continuous peripheral edge from a sheet of metal material of generally uniform thickness,

forming said blank with predetermined initial transverse dimensions less than required to form a can end having a predetermined final configuration and based upon the final transverse dimensions of the can end,

subjecting an annular peripheral portion of said blank to a thickness reducing operation until the thickness of said



peripheral portion is reduced as compared to the initial thickness of said blank and the transverse dimensions of said blank are increased to substantially the size required to form said predetermined final configuration having said final transverse dimensions, and

reshaping said peripheral portion to said final configuration to adapt said can end for attachment to said can body.

3,957,006

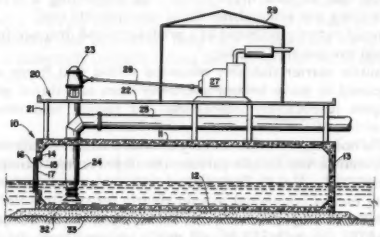
WATER TRANSPORTABLE PUMP STATION

Pierre A. Lapeyre, P.O. Box 430, Houma, La. 70360

Filed May 10, 1974, Ser. No. 468,646

Int. Cl.² B63B *35/00*

U.S. Cl. 114.5 R **2 Claims**



1. A water transportable pump station comprising a floatable-submergible concrete barge comprising a top and bottom, side and end walls, at least one of said end walls having a flood opening therethrough, a pump support superstructure secured to the top of said concrete barge, at least one pump secured to the superstructure on top thereof and having an intake extending vertically within and above said barge, a pump driving prime mover carried by said superstructure and connected to drive said pump, flooding means including a cover and a screen for said opening in one end wall of the barge for flooding the barge with the water to be pumped above the pump intake level, and discharge means for discharging the water pumped from the pump to the other side of a barrier adjacent the barge.

3,957,007

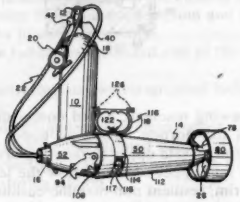
AIR POWERED WATER PROPULSION METHOD AND APPARATUS

John R. Thomas, Wichita, Kans., assignor to The Thomas Company, Wichita, Kans.

Filed Nov. 15, 1974, Ser. No. 524,035

Int. Cl.² A63B *31/00*

U.S. Cl. 114—16 A **23 Claims**



23. The method of propelling a propulsion vessel for a diver having air breathing means and having an air tank for providing air to said breathing means, said vessel having an air motor and a closed vessel housing, comprising:

a. supplying air from said tank to said motor during propulsion operations,

b. exhausting air passing through said motor into the interior of said housing,

c. supplying air to said air breathing means from said interior of said housing during propulsion operations,

d. exhausting air from said housing to the exterior of said vessel when pressure within said housing exceeds a preset level, and

e. disconnecting said tank from said motor during diver operations independent of said vessel while supplying air from said tank directly to said breathing means.

3,957,008

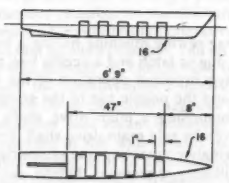
DRAG REDUCTION OF WATER VEHICLES USING GAS CREATED BY ELECTROLYSIS ON ELECTRODES ATTACHED TO THE HULL

Michael E. McCormick, 1906 Sands Drive, Pendennis Mount, Annapolis, Md. 21402, and Rameswar Bhattacharyya, 1602 Ridout Road, Amberly, Annapolis, Md. 21401

Filed Mar. 28, 1974, Ser. No. 455,818

Int. Cl.² B63B *1/34*

U.S. Cl. 114—67 A **6 Claims**



1. The method of reducing the drag of a marine vessel by introducing a gas into the boundary layer water along a marine vessel's hull which comprises:

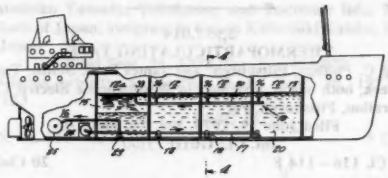
placing discrete electrically conductive members to extend along said hull transversely of the centerline of said hull and electrolyzing the water.

3,957,009

SHIP BALLAST, OIL AND WATER SEPARATION SYSTEM

James Di Perna, 85 Foxhill Terrace, Staten Island, N.Y. 10305

Filed Oct. 25, 1974, Ser. No. 517,897
Int. Cl.² B63B 25/08
U.S. Cl. 114—74 R 5 Claims



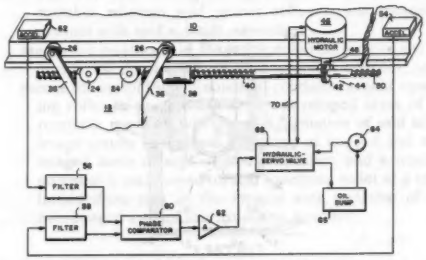
1. In a ship ballast, oil and water separation system for use on oil tanker vessels, the combination of a plurality of oil tanks in said vessel, a pipe assembly connecting to each of said oil tanks and positioned to lie within the upper part of said oil tanks at slightly below water surface level when said tanks are filled with water, a collection tank connected to the output of said pipe assembly for removal of residue floating oil from said oil tanks into said collection tank, and a floating oil collection unit located in each of said oil tanks coupled to the pipe assembly positioned within that tank, said floating oil collection unit including a funnel whose top is maintained at the water surface level, below the floating oil, when said tanks contain water with a layer of oil thereon.

3,957,010

STABILIZATION SYSTEM FOR WATER VEHICLES, PLATFORMS, AND STRUCTURES IN WIND-MAINTAINED SEAS

Herman A. Soulant, Jr., 501 Gilscot Place, Rockville, Md. 20851

Filed Aug. 29, 1975, Ser. No. 608,857
Int. Cl.² B63B 43/14
U.S. Cl. 114—123 6 Claims



1. A stabilization system for water vehicles, floating platforms, structures having buoyant pontoons in wind-maintained seas comprising:

means for measuring the wavelength of the significant wave in an oncoming wind-maintained wave system in the open sea; and

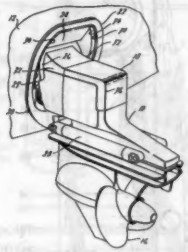
means for laterally adjusting buoyant pontoons on said platform to a spacing corresponding to the wavelength of said significant wave.

3,957,011

KICK-UP/STEERING CAMMING FEATURE FOR INBOARD-OUTBOARD MARINE DRIVE

John W. Hurst, Port Huron, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed July 17, 1975, Ser. No. 596,781
Int. Cl.² B63H 5/12
U.S. Cl. 115—41 R 6 Claims



1. In an article of manufacture for use with an inboard engine and a rearwardly extending drive means in a boat, an outboard power leg including an upper gear housing and a propeller means driven by the drive means through the upper housing, a transom mounting means through which the drive means extends for connection within the upper gear housing, pivot means connecting the power leg to the trnasom mounting means for movement about both a generally vertical turning axis and a generally horizontal kick-up axis, the improvement comprising a pair of cam portions associated with the transom mounting means and oppositely disposed one to each side of the upper gear housing, and a pair of cam follower portions associated with opposite sides of the upper gear housing for respectively engaging one of the cam portions upon turning of the power leg about the vertical axis in either direction through an angle which upon kick-up causes engagement between a cam portion and a cam follower portion respectively, the cam portion being so shaped that, as the power leg swings upwardly on its horizontal axis in a kick-up motion when a cam portion and a cam follower portion are engaged, the power leg is continually urged toward a lesser turning angle as the cam follower portion rides upwardly against the cam portion during the kick-up motion whereby the forces generating the kick-up motion tend to be dissipated by turning of the power leg.

3,957,012

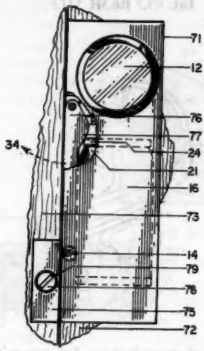
ANTI-BURGLARY SOUND EMITTING DEVICE

Charles R. Fegley, 1606 Frush Valley Road, Laureldale, Pa. 19605, and Werner F. Esseluhn, 12 Larchwood Road, Wyomissing, Pa. 19610

Filed Dec. 6, 1974, Ser. No. 530,094
Int. Cl.² G08B 13/08; B67D 5/32
U.S. Cl. 116—6 11 Claims

1. An anti-burglar sound emitting device for use with a pressurized container, the device comprising: a. a body member mounted on support means; b. means for slideably supporting said pressurized container in a first chamber in said body member; c. movable means in a second chamber in the body member for emitting sound by the use of a pressurized fluid, said movable sound emitting means comprising a closure wall for said second chamber d. a fluid passageway in said body member for directing a fluid from said pressurized container therethrough to said sound emitting means, said passageway having an entry section between said first and second chamber at one end of the body member; e. a spring biasing said container toward said entry section; f. means for selectively discharging fluid from said container into said entry section; g. means for releasably retaining said container dis-

placed from said entry section, said retaining means including a trigger element, said trigger element being mounted for movement between an actuation position and a release position, said trigger element in said actuation position in engagement with said container to retain said container in a cocked



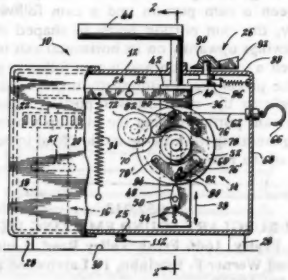
position, said trigger element in said release position releasing the container from said cocked position whereby means on the container coacts with said pass ageway in the entry section in allowing discharge of fluid through said passageway to said sound emitting means to produce sound.

3,957,013

PORTABLE EVENT DETECTING ALARM

Vladimir Ignatjev, 39 Ledgewood Drive, Norwalk, Conn. 06850

Filed Aug. 28, 1974, Ser. No. 501,208
Int. Cl.² G08B *13/12*
U.S. Cl. 116—81 **8 Claims**



1. A mechanism for producing an indication for an alarm in response to a detectable event comprising

a housing;

an actuator mounted to the housing for movement along a predetermined path from a cocked position to an alarm producing position;

a biased event detector including a flexible element and having a cocked position and having a trigger contacting surface to inhibit motion of said actuator, said event detector mounted to the housing to move along the predetermined path to generate an event sensing motion of the trigger contacting surface in a direction selected to enable release motion of the actuator along the predetermined path when the event detector, in its cocked position, is moved in response to a detected event; and

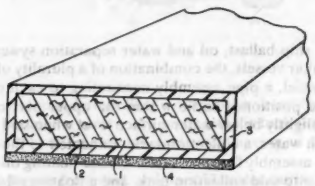
a trigger element pivotally mounted to the actuator and having a contacting edge which is located thereon for edge contact with the trigger contacting surface of the event detector at an area thereof selected to lie along a line which is generally parallel with the predetermined path to inhibit release movement of the actuator along the predetermined path, said trigger element being mounted for pivot movement to a release position in response to motion of the event detector to enable the actuator to move to an alarm producing position in response to an event sensing motion of the event detector.

3,957,014

THERMOPARTICULATING TAPE

David C. Phillips, Pittsburgh, and James D. B. Smith, Turtle Creek, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 19, 1975, Ser. No. 588,570
Int. Cl.² G01D *13/00*
U.S. Cl. 116—114 F **20 Claims**



1. A thermoparticulating tape comprising:

a. a flexible fibrous material;

b. a compound which thermoparticulates at a temperature below 200°C dispersed throughout said flexible, fibrous material; and

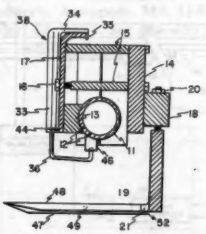
c. a flexible outer coating over said flexible, fibrous material through which the products formed when said compound thermoparticulates can pass.

3,957,015

POLYMER FLOW CONTROL SYSTEM FOR USE AND MANUFACTURE OF PRINTING PLATES

Lawrence W. Harris, Raleigh, N.C., assignor to News & Observer Publishing Co., Raleigh, N.C., a part interest

Filed Mar. 15, 1974, Ser. No. 451,444
Int. Cl.² B05C *11/04*
U.S. Cl. 118—100 **6 Claims**



1. In a device for producing polymer printing plates, said device including a dispense valve having a plurality of orifices therein and an elongated doctor blade adapted to transverse a backing plate at a predetermined spaced distance therefrom to spread disbursed polymer on such plate, a polymer flow control system comprising: means for preventing the flow of polymer from at least one of said plurality of orifices in said dispense valve, said preventing means including a generally C-shaped means with the ends thereof biased toward each other and grippingly disposed on opposite sides of said dispensing valve with one end being adapted to cover at least one

of said orifices whereby better polymer disbursion can be accomplished; and means for preventing the dispersed polymer from flowing around at least one end of said elongated doctor blade during the spreading of said polymer whereby the spread pattern of such a polymer can be more accurately controlled.

3,957,016

DEVELOPER WRINGING AND REMOVING APPARATUS

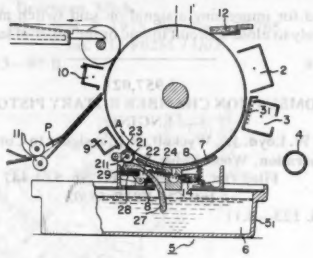
Katsuhiko Yamada, Yokohama, and Toshihide Iida, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 26, 1973, Ser. No. 401,078

Claims priority, application Japan, Sept. 29, 1972, 47-97153

Int. Cl.² G03G 15/10

U.S. Cl. 118—637 **5 Claims**



1. An electrophotographic copying apparatus comprising:

a rotatable member;

means for forming an electrostatic latent image on said rotatable member;

means for applying a liquid developer to said rotatable member for developing the electrostatic latent image formed thereon;

liquid developer restricting means including a squeezing roller for removing excess liquid developer from said rotatable member, said squeezing roller being disposed spaced apart from said rotatable member and at a position where the surface of said rotatable member moves upwardly;

spacer roller means for maintaining said spaced apart relation between said squeezing roller and said rotatable member wherein said spacer roller means rotates in contect with said rotatable member;

means for rotating said squeezing roller to remove the excess liquid developer from said rotatable member; and

means for establishing a potential condition at said squeezing roller to prevent fog at non-developed areas of the rotatable member, wherein said formation of said latent image results in unequal potentials at imaged and non-imaged areas of said rotatable member, and wherein a potential is maintained on said squeezing roller at a value intermediate that of the imaged area and that of the non-imaged area of said rotatable member.

3,957,017

CONTAMINANT FILTER IN A CLOSED-LOOP AQUACULTURE SYSTEM

Garibaldi M. Carmignani, Woodside; James C. McCarty, San Carlos, and George Monaco, Los Altos, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Nov. 4, 1974, Ser. No. 518,821

Int. Cl.² A01K 61/00

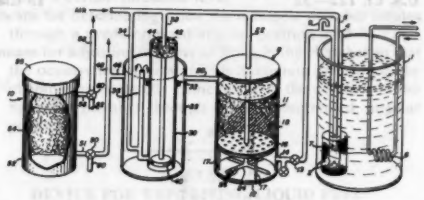
U.S. Cl. 119—3 **15 Claims**

1. An aquaculture apparatus which comprises

a container to hold water in marine animals;

a screening device to retain said marine animals in said container while allowing water to pass therethrough;

a biological filter comprising (*a*) an elongated enclosure being closed at the base, said enclosure (i) having at least one liquid inlet at the base of said enclosure and (ii) being arranged to retain water when flowing in through the inlet, (*b*) a liquid permeable support means above said inlet, (*c*) a porous medium sufficient to grow nitrosomonas and nitrobacter organisms on said support means, and (*d*) a liquid outlet located above said porous medium;



an open-cell polyurethane foam filter made by reacting a poly(oxypropylene) glycol with a tolylene diisocyanate;

water transfer means interconnecting said container, biological filter, and said polyurethane foam filter and

pump means to circulate said water from said container through said screening device, biological filter, and polyurethane foam filter in sequence and back to said container.

3,957,018

MILKING APPARATUS

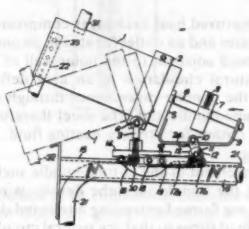
Jeremiah Barrett, Mullinahone, County Tipperary, Ireland

Filed Sept. 20, 1974, Ser. No. 507,735

Claims priority, application Ireland, Sept. 20, 1973, 1682/73

Int. Cl.² A01J 7/00

U.S. Cl. 119—14.08 **16 Claims**

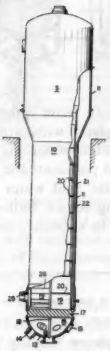


1. A milk flow rate sensing device comprising a container having a floor portion and provided with a milk inlet adapted for connection by a milk line to a teat-cup cluster, and a milk outlet adapted for connection by a milk line to milk receiver means and a vacuum source, the container being mounted upon a fulcrum at or adjacent one end of the container such that the container may rock about the fulcrum so as to alter the inclination of the floor portion of the container relative to the horizontal, and counterbalancing means for the container positioned to that side of the fulcrum opposite the major portion of the container, the counterbalancing means being so arranged that when empty the container rests in a first position but when milk flow into the container is such that milk in the container exceeds a predetermined volume the container overbalances the counterbalancing means and tilts from the first position into a second position where it remains until milk flow falls such that the milk in the container is below a predetermined volume whereupon it tilts back towards the first position to acutate cut-off means for disconnecting the teat-cups from the vacuum source.

3,957,019
HEAT EXCHANGERS

Anthony Ruhe, Fonthill, and James H. D. Nickerson, St. Catharines, both of Canada, assignors to Foster Wheeler Limited, St. Catharines, Canada

Filed Mar. 28, 1975, Ser. No. 563,041
Claims priority, application Canada, Aug. 15, 1974, 207120
Int. Cl.² F22B *1/06;* **F22D** *7/00*
U.S. Cl. 122—32 **15 Claims**



1. An improved heat exchanger comprising; a shell with an inlet for water and an outlet for steam, an annular downcomer shell disposed adjacent to the inner wall of the shell for permitting natural circulation in an area defined between the shell and the annular downcomer through openings therein, and a U-tube bundle and tube sheet therefor having opposed inlets and outlets for primary heating fluid, the improvement comprising:

an arrangement of the U-tube bundle such that at intervals about the bundle the tube density is reduced such that lanes are formed extending a selected distance within the bundle of tubes so that the natural circulation through the openings of the annular downcomer is increased towards that portion of the bundle somewhat removed from the openings.

3,957,020
IGNITION SYSTEM FOR ROTARY PISTON ENGINES

Yoshio Sasaki, Toyota, and Minoru Morita, Nagoya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

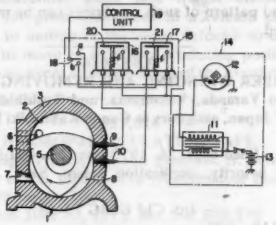
Filed June 19, 1974, Ser. No. 480,845
Claims priority, application Japan, Feb. 18, 1974, 49-18521
Int. Cl.² F02B *53/12*
U.S. Cl. 123—8.05 **2 Claims**

1. An ignition system for a rotary piston engine having two ignition plugs arranged in circumferentially spaced relation in the direction of piston rotation, wherein the improvement comprises:

ignition circuit means including a battery, a single ignition coil and at least one distributor;

means including switch means for interconnecting said ignition circuit means to each of said plugs; and

means for sensing the operating condition of said engine

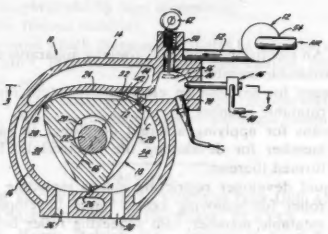


and for impressing a signal on said switch means selectively to close a circuit to one or the other of said plugs.

3,957,021
PRECOMBUSTION CHAMBER ROTARY PISTON DIESEL ENGINE

Robert W. Loyd, Jr., Wyckoff, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Oct. 15, 1974, Ser. No. 514,447
Int. Cl.² F02B *53/02*
U.S. Cl. 123—8.11 **13 Claims**



1. In a rotary internal combustion engine of the diesel type having a housing defining a trochoidal, two-lobe cavity in which a rotor, having three contiguous flank portions and pockets in each such flank portion, is eccentrically mounted for rotation and which defines with the housing a plurality of working chambers that successively expand and contract in volumetric size as the rotor and housing rotate relative to each other, a fuel combustion system comprising:

a. an air intake port in the housing communicating with a working chamber during its expansion cycle of operation for passing only air into the working chambers for compression of such air;

b. an exhaust port in the housing communicating with a working chamber during its exhaust cycle of operation for expelling spent products of combustion from the working chambers;

c. a precombustion chamber adjacent said working chambers;

d. outlet port means in the housing for communicating the precombustion chamber with the working chambers at a point angularly spaced in the direction of rotor rotation a relatively small distance past the lobe junction of the housing cavity remote from said air intake port;

e. means for injecting all of the fuel required for a particular engine operating speed and load into the precombustion chamber;

f. a source of compressed air having a pressure substantially greater than the maximum pressure of the compressed air in the working chamber at full compression and having a

heat of compression sufficient to effect spontaneous ignition of the fuel injected by said means;

g. passageway means communicating said source of compressed air with the precombustion chamber to pass such compressed air into the precombustion chamber and into admixture with the fuel to effect thereby ignition of the fuel injected by said fuel injection means into the precombustion chamber; and

h. valve means for controlling compressed air flow from the passageway means into the precombustion chamber in relation to rotor rotation so that the ignited fuel flashes from the precombustion chamber through the outlet means when the rotor is in a preselected angular position.

3,957,022

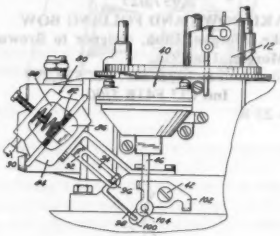
CARBURETOR DECELERATION EMISSION CONTROL

John H. Furbacher, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sept. 2, 1975, Ser. No. 609,765

Int. Cl.² F02M *11/02*

U.S. Cl. 123—97 B **9 Claims**



1. A carburetor having separate primary and secondary air/fuel mixture induction passages each connected at one end to air at essentially atmospheric pressure and adapted to be connected at its opposite end to an engine intake manifold to be subject to the change in depression therein from a minimum level to a maximum vacuum force level occurring during engine deceleration conditions, a separate throttle valve mounted for a rotatable movement across each of the passages between an open and closed position to control flow through the passage, first control means operably connected to the throttle valves to open the valves, and second control means operably connected to the secondary induction pssage throttle valve and operable independently of the first control means during engine deceleration operating conditions to crack open the secondary passage throttle valve to provide air/fuel mixture flow through the secondary induction passage.

3,957,023

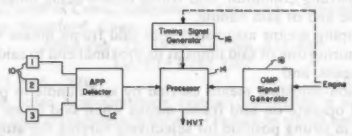
PRESSURE RESPONSIVE ENGINE IGNITION CONTROL SYSTEM

M. Maurice Peterson, 1881 Nevada St., Salt Lake City, Utah 84108

Filed Mar. 29, 1974, Ser. No. 456,174

Int. Cl.² F02P *5/04*

U.S. Cl. 123—117 R **13 Claims**



1. In an internal combustion engine having at least one combustion chamber and a rotatable member, a pressure responsive ignition control system for use in said engine comprising

means for detecting the occurrence of substantially maximum pressure in the combustion chamber when the chamber is fired, said detecting means including means for monitoring the pressure in said chamber, and means for generating a first signal when the pressure in the chamber begins to decrease after having increased beyond a certain threshold level,

means for determining when the rotatable member rotates through a predetermined angular position, and

means for adjusting the time of firing in the chamber so that the occurrence of substantially maximum pressure in the chamber substantially coincides with the rotation of the rotatable member through said predetermined, angular position.

3,957,024

DEVICE FOR VAPORIZING LIQUID FUEL

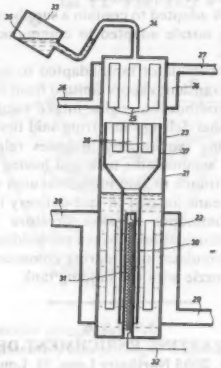
Walter D. Mills, Mold, Wales, assignor to Shell Oil Company, Houston, Tex.

Filed Sept. 11, 1974, Ser. No. 505,197

Claims priority, application United Kingdom, Sept. 11, 1973, 42635/73

Int. Cl.² F02M *31/00*

U.S. Cl. 123—122 E **10 Claims**



1. In the combination (1) a combustion chamber-containing apparatus selected from the group consisting of an internal combustion engine and a gas turbine, and (2) a device for vaporizing liquid fuel prior to its introduction into the combustion chamber of said apparatus which device comprises a heat pipe which is in the form of a sealed vessel containing heat transfer fluid comprising a vaporizable liquid having a boiling point at atmospheric pressure up to 400°C and a non-condensable gas, which heat pipe comprises:

a. a heat-receiving zone operatively engaging the exhaust system of said apparatus, for heating the heat transfer fluid and vaporizing said liquid with the heat from said exhaust system,

b. a heat-discharging zone operatively engaging the fuel inlet system of said apparatus for cooling and condensing the heat transfer liquid by transference of heat to said fuel to be evaporated, said heat discharging zone communicating with said heat receiving zone whereby condensed heat transfer liquid is directly returned to said heat receiving zone,

c. the improvement comprising at least one heat transfer liquid storage zone in communication with the heat receiving zone or the heat discharge zone for storage of at least a portion of the heat transfer liquid and non-conden-

sable gas and constructed such that the stored liquid separates the stored gas from the contents of the remainder of the heat pipe.

3,957,025

METHOD AND APPARATUS FOR CONTROLLING DISPLACED VAPOR EMISSIONS IN MOTOR VEHICLES

Stephen D. Heath, Chula Vista, and Lorenzo Borbolla, Jr., Dulzura, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Nov. 4, 1974, Ser. No. 520,606
Int. Cl.² F02M 51/00
U.S. Cl. 123—136 **11 Claims**

1. A vapor recovery system in a motor vehicle for preventing escape of fuel vapor to the atmosphere during liquid fuel transfer comprising in combination:

a. a holding tank adapted to contain a supply of liquid fuel;

b. a dispensing nozzle adapted to communicate with said holding tank;

c. a vacuum accumulator tank adapted to temporarily accommodate transient vapors emitted from said first tank;

d. an internal combustion engine intake vacuum source;

e. a unidirectional delivery line from said first holding tank communicating sequentially in series relationship with said vacuum accumulator tank and having a termination end at an entrance to said intake vacuum source; and

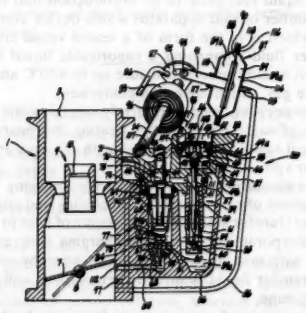
f. regulating means located in said delivery line and maintaining a continuous negative pressure head and restricted communication between the holding tank and the vacuum accumulator tank during communication of the dispensing nozzle with the holding tank.

3,957,026

COLD STARTING ENRICHMENT DEVICE

Jerry H. Winkley, 2005 Northaire Lane, St. Louis, Mo. 63138, and Ralph G. Hardwick, 4265 Shenandoah, St. Louis, Mo. 63110

Filed July 24, 1974, Ser. No. 491,194
Int. Cl.² F02N 17/00
U.S. Cl. 123—179 G **5 Claims**



1. In an internal combustion engine including a carburetor having a pivotal throttle plate mounted in an air inlet passageway of said carburetor, a source of fuel and a source of air, the improvement comprising auxiliary fuel supply system means for continuously regulating the fuel-air ratio of said engine from a first, cold starting condition to a second, normal run condition, said auxiliary fuel supply system means comprising a fuel passageway in said carburetor having an outlet positioned below or during certain running conditions in ported relationship to said throttle plate, said fuel passageway extending from said outlet to said source of fuel, shut-off means movably mounted to said carburetor for blocking said fuel passage, air insertion means operatively connected to said shut-off means for admitting air to said fuel passageway, first means for operating said air insertion means upon engine start, second means for operating said shut-off means so as to progressively reduce the output of an air-fuel mixture through said carburetor as the engine warms, moveable fuel metering means operatively connected in said fuel passageway upstream of said air insertion means and said shut-off means, and means for operating said moveable fuel metering means operatively connected to a source of engine manifold pressure.

3,957,027

TAKE-DOWN AND FOLDING BOW

Harry E. Drake, Morgan, Utah, assignor to Browning Mfg. Company, Morgan, Utah

Filed Jan. 8, 1975, Ser. No. 539,297
Int. Cl.² F41B 5/00
U.S. Cl. 124—23 R **9 Claims**

1. In an archery bow, a bow string, a bow handle, a pair of limbs connected at their proximal ends through respective connectors by said handle and at their distal ends by a said bow string, the improvement wherein each said connector comprises:

a frame means for supporting and pivoting the limbs between a strung position and a collapsed position wherein the limbs are folded across the back of the bow in an unstrung condition, said frame means being hinged near one end of said handle,

clamping means associated with said frame means for anchoring one of said limbs at its proximal end to said frame means; and

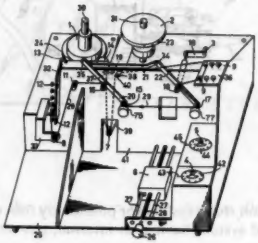
tension-adjusting means carried by said handle in position to operate on said frame means when said frame means is in strung position for selectively varying the attitude of said frame means with respect to the handle, thereby selectively increasing or decreasing the draw weight of said one of said limbs.

3,957,028

WIRE-TYPE CUTTING MACHINE

Jean-Yves Lesiourd, Limeil-Brevannes, and Jacques Charles Louis Bunel, Vigneux-sur-Seine, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 25, 1974, Ser. No. 482,906
Claims priority, application France, June 25, 1973, 73.23049
Int. Cl.² B28D 1/02
U.S. Cl. 125—12 6 Claims



1. A wire-type cutting machine comprising a support for holding a workpiece to be cut in a given location, means for transporting a wire along a given direction and a means for displacing the wire in a transverse direction across said location, wherein the means for transverse displacement comprises a single parallelogram linkage comprising first and second parallel elements each mounted for pivotal motion about parallel axes, said elements having respective first and second wire guide points equally spaced from said axes, means for guiding the wire about said guide points, said wire travelling in said given direction from said first guide point to said second guide point, means for maintaining said elements parallel, and means for pivoting said elements about said axes so as to cause said first guide point to approach said given location, said parallelogram being so disposed that said pivoting will press the wire against a workpiece in said location, whereby the direction of wire transportation and parallogram pivoting are such that friction or sticking of the wire moving against a workpiece tends to cause the parallel members to pivot in a direction opposite to said means for pivoting and therefore to move the wire out of contact with the workpiece.

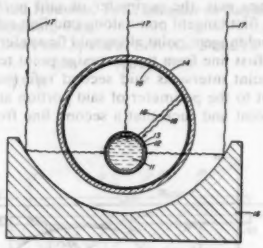
3,957,029

GREENHOUSE WINDOW FOR SOLAR HEAT ABSORBING SYSTEMS DERIVED FROM CD_2SNO_4

Arthur Jack Nozik, Westport, and Gottfried Haacke, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 12, 1973, Ser. No. 331,407
Int. Cl.² F25J 3/02
U.S. Cl. 126—270 5 Claims

1. A solar heat-absorbing system comprising a substrate having high transmittance for solar radiation which has deposited thereon a layer of cadmium stannate having high transmittance for solar radiation and high reflectance for thermal infrared radiation and positioned adjacent to said cadmium stannate layer a body having a high absorptivity for solar radiation, said body having heat transfer means attached



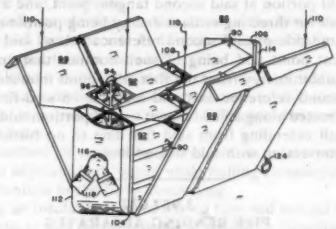
thereto, whereby solar energy absorbed in said body is withdrawn therefrom as useful energy.

3,957,030

SOLAR ENERGY POWER SYSTEM

Billy K. Davis, Huntsville, Ala., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 421,702, Dec. 4, 1973, Pat. No. 3,903,699.
This application Mar. 21, 1975, Ser. No. 561,020
Int. Cl.² F24J 3/02
U.S. Cl. 126—270 3 Claims



1. A solar boiler comprising:

a reflector assembly comprising at least one V-shaped channel; and

a plurality of elongated, diamond-shaped fluid coupled tubes lying generally within said V-shaped channel and along a plane which bisects the apex of said V-shaped channel and which plane intersects opposite edge pairs of corners of each tube, the tubes extending lengthwise in a direction parallel with said channel;

whereby solar radiant energy striking said reflector is directed onto the surface of one tube and then over to the surface of an adjacent tube.

3,957,031

LIGHT COLLECTORS IN CYLINDRICAL GEOMETRY

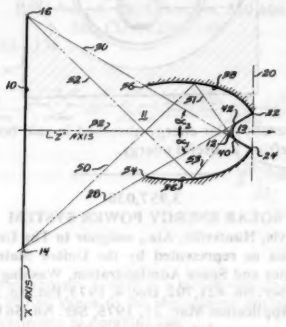
Roland Winston, Chicago, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 29, 1975, Ser. No. 581,613
Int. Cl.² F24J 3/02; G02B 5/10
U.S. Cl. 126—270 8 Claims

1. A device for concentrating energy from a source of radiant energy of finite dimension defined by first and second opposing edge points, comprising:

an energy transducer, a portion of whose cross section is bounded by a first reference axis with said portion and said first reference axis coplanar with a line coupling the edge points, the perimeter of said portion being convex

and being limited to the same side of said first reference axis as the source, said portion having a second reference axis extending therethrough perpendicular to said first reference axis, the perimeter of said portion extending from a first tangent point along said first reference axis to a second tangent point along said first reference axis such that a first line from the first edge point to said first tangent point intersects said second reference axis and is tangent to the perimeter of said portion at said first tangent point and such that a second line from the second



edge point to said second tangent point intersects said second reference axis and is tangent to the perimeter of said portion at said second tangent point, and a first side wall for directing radiant energy being positioned on the same side of said second reference axis as said first tangent point and being of such contour that any ray of radiant energy from the first edge point intersecting said second reference axis and incident on said first wall is directed along a line tangent to said portion, said first side wall extending from said first line to no further than a intersection with said second line.

3,957,032

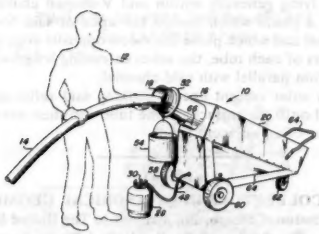
PIPE BENDING APPARATUS

Anton F. E. Jelesko, P.O. Box 152, Georgetown, Calif. 95634

Filed Mar. 13, 1972, Ser. No. 234,054

Int. Cl.² F23C *5/00*

U.S. Cl. 126—271.2 R **9 Claims**



1. Apparatus for heating plastic pipe to permit it to be molded to a desired curvature, comprising:

a. an elongated container having an open end for receiving the plastic pipe therein,

b. means for supporting said container at an acute angle with respect to horizontal,

c. a fluid heat exchange medium contained in said container and disposed for directly contacting a pipe to be heated, and

d. means for applying heat to said container.

3,957,033

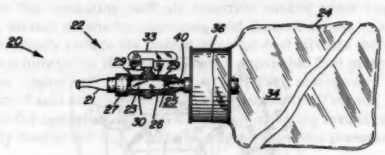
VENTILATION STUDY SYSTEM

Harry S. Winchell, Lafayette, and Thomas C. Hall, Fremont, both of Calif., assignors to General Electric Company and Medi-Physics, Inc., both of San Jose, Calif.

Filed Aug. 15, 1973, Ser. No. 388,489

Int. Cl.² A61B *6/00*

U.S. Cl. 128—1.1 **12 Claims**



1. A ventilation study system for pulmonary function studies in patients, said system having an internal, gas-retaining volume comprising:

a. a shearable polymeric capsule containing a gaseous radioisotope;

b. valve means comprised of a radiation shielding material having an internal cavity holding said capsule therein, with said cavity forming a portion of the gas-retaining volume of the system and said valve means further having a bore intersecting the cavity at an intermediate point of said capsule;

c. a rotatable valve plug comprised of a radiation shielding material positioned within the bore and having an opening concentric and normally aligned with the internal cavity of said valve means, said valve plug causing, upon rotation thereof, said capsule in the internal cavity of said valve means to be sheared and thereby releasing said gaseous radioisotope;

d. patient breathing means being operatively connected to the internal cavity of said valve means; and

e. breathing bag means defining a predetermined portion of the gas-retaining volume of the system being operatively connected to said valve means so as to be in communication with the internal cavity thereof, said breathing bag means being adapted to receive the patient's exhalation containing said gaseous radioisotope.

3,957,034

METHOD OF CYTOLOGICAL DIAGNOSTICATION OF PRECANCER AND CANCER

Velta Mikelevna Bramberga, ulitsa Gregora, 8. kv. 20; Teodor Arvidovich Grendze, ulitsa Suvorova, 16, kv. 24; Daina Arvidovna Plegere, ulitsa Dzelzevas 15/2, Korpus 2, kv. 34; Arkady Yakovlevich Khesin, ulitsa Suvorova, 16, kv. 18, and Etil Kharaldovich Smiltniex, ulitsa Aglonas, 10, Korpus 1, kv. 26, all of Riga, U.S.S.R.

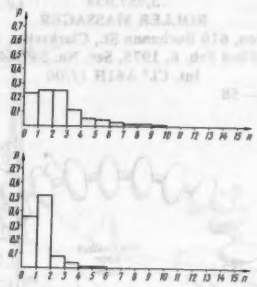
Filed Aug. 13, 1974, Ser. No. 496,994

Int. Cl.² A61B *5/00*

U.S. Cl. 128—2 R **10 Claims**

1. A method of cytological diagnosis of precancer and cancer, comprising obtaining cytological preparations containing cells suspected of being atypical, isolating from among the suspect cells of said preparations those cells which contain nucleoli; classifying the cells thus isolated by the number of nucleoli contained therein; and determining the ratio of the number of cells containing greater than two nucleoli to the number of those containing one or two nucleoli; and, should

said ratio be less than unity, the preparation under study is diagnosed as cancerous, whereas should said ratio be greater

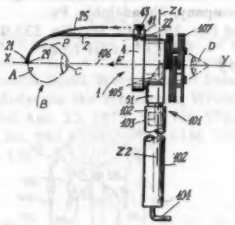


than unity, the preparation under study is diagnosed as precancerous.

3,957,035
OPHTHALMOLOGICAL DEVICE USEFUL FOR EYE SURGERY

Jean Chassaing, 23, avenue de la Gare, Brive, Correze, France

Continuation of Ser. No. 380,586, July 19, 1973, abandoned. This application Jan. 17, 1975, Ser. No. 541,766
Claims priority, application France, Sept. 8, 1972, 72.31840
Int. Cl.² A61B 3/00
U.S. Cl. 128—2 T **7 Claims**



1. An ophthalmological device useful for eye surgery, comprising in combination:

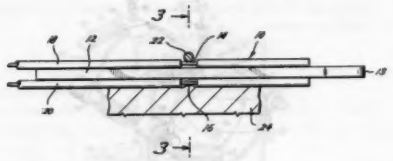
an ophthalmoscope having (i) an optical system for projecting a beam of light along a sighting axis onto the fundus of a patient's eye in order to illuminate a inside point of the fundus lying on said axis, and (ii) an eyepiece for taking a sight on said illuminated inside point, and

a probe having (i) an attachment end portion connected to and protruding from said ophthalmoscope opposite to said eyepiece thereof at a distance from said sighting axis, and (ii) a curved free end portion that curves towards said sighting axis and terminates in a point-like operative tip which lies on said sighting axis to pass around the patient's eyeball and engage an outside point of the sclera in registry with said illuminated inside point of the fundus.

3,957,036
METHOD AND APPARATUS FOR RECORDING ACTIVITY IN INTACT NERVES

Nils A. Normann, Houston, Tex., assignor to Baylor College of Medicine, Houston, Tex.

Filed Feb. 3, 1975, Ser. No. 546,228
Int. Cl.² A61B 5/04
U.S. Cl. 128—2.1 R **7 Claims**



1. An electrode probe for measuring activity in intact nerves comprising,

an electrically non-conductive thin and substantially flat carrier having first and second sides opposite to each other,

a first electrode positioned and attached on the first side of the carrier,

a second electrode positioned and attached on the second side of the carrier and positioned diametrically opposed to the first electrode,

electrically conductive contact areas of the two electrodes being of the same size and located symmetrically in precise opposition to each other,

an insulated wire connected to each of the electrodes, and

differential amplifier means connected to said insulated wires measuring the voltage difference between said electrodes.

5. A method of measuring activity in an intact nerve attached to adjacent body tissue while nulling extraneous electrical potentials in the body comprising,

placing an insulating carrier having first and second identical electrodes positioned diametrically on opposite sides of the carrier in the body,

positioning the carrier with the first electrode in contact with the nerve but out of contact with the tissue and the second electrode in contact with the tissue but out of contact with the nerve, and

measuring the voltage between the electrodes whereby activity in the intact nerve is measured but extraneous electrical potentials in the body are nulled.

3,957,037
READOUT ELECTRODE ASSEMBLY FOR MEASURING BIOLOGICAL IMPEDANCE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Leslie D. Montgomery, Mountain View, and Dwight L. Moody, Jr., Saratoga, both of Calif.

Filed Feb. 24, 1975, Ser. No. 552,454
Int. Cl.² A61B 5/04
U.S. Cl. 128—2.1 E **7 Claims**

1. An electrode assembly adapted to be used in an apparatus for measuring electric impedance between parts of a living animal comprising:

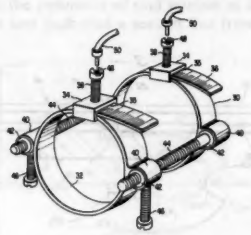
a. a first ring electrode having opposite ends which overlap for adjusting the diameter thereof;

b. a second ring electrode having opposite ends which overlap for adjusting the diameter thereof;

c. first and second male contact assemblies respectively electrically coupled to said first and second ring electrodes;

d. means for adjusting the circumference of said ring electrodes, said means comprising:

1. a band encircling each of said ring electrodes where the ends overlap,
2. a tapped hole in each of said bands,
3. a conductive set screw inserted into each of said tapped holes and clamping the overlapping ends of each said



ring electrode, said set screws each having an axial hole disposed in the head thereof, and said first and second male contacts being inserted in said axial holes; and

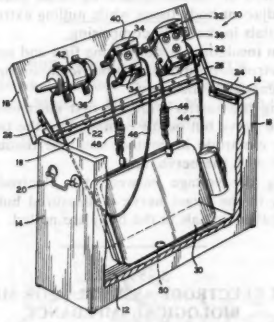
e. means coupled to each of said rings for maintaining said rings at an adjustable fixed axial position with respect to each other, said means for adjusting axial position being nonconductive for maintaining electrical isolation between said ring electrodes.

3,957,038

MASSAGE UNIT CONSOLE

Theodore S. Roberts, 26151 Lake Shore Blvd., Apt. 521, Euclid, Ohio 44132

Filed June 6, 1975, Ser. No. 584,344
Int. Cl.² A61H 1/00
U.S. Cl. 128—24 R **10 Claims**



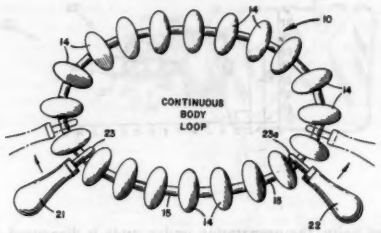
1. A massage system console for use with electrically powered massage pads having generally flat, expansive surfaces, said console comprising a generally rectangular box-like container having narrow bottom, top and end walls and a pair of relatively wide side walls which accommodate therein a massage pad with its flat expansive surfaces lying in generally vertical planes, hinge means extending along the upper edge of one of said wide side walls and hingeably connected said one side wall to said top wall to permit said top wall to swing up to open the console at its top, massage pad control panel mounting means on the surface of said top wall which faces inside said container when the top wall is closed for mounting a control unit in a manner such that it is held within said container when the top wall is closed but is automatically brought to an exposed and operative position when the top wall is opened and stop means arranged to limit the opening of the top wall to a position such that the weight of the control unit and top wall are sufficient to maintain the top wall opened but insufficient to overturn said container.

3,957,039

ROLLER MASSAGER

Fritz H. Ehren, 610 Buchanan St., Clarksville, Ark. 72830

Filed Feb. 6, 1975, Ser. No. 547,445
Int. Cl.² A61H 1/00
U.S. Cl. 128—58 **14 Claims**



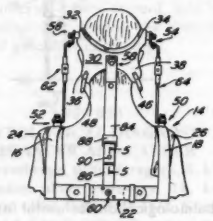
1. A device for massaging a part of the human body comprising a looped extensible member, a plurality of spaced rollers having a continuous peripheral surface about the circumference thereof, the radially outward portion of the roller being substantially parabolic in cross-section, and a handle which can be attached and removed from the loop without disassembly of the looped member.

3,957,040

CERVICAL BRACE

Anthony Calabrese, Philadelphia, Pa., assignor to Charles Greiner & Company, Philadelphia, Pa.

Filed Dec. 16, 1974, Ser. No. 533,059
Int. Cl.² A61H 1/02
U.S. Cl. 128—75 **12 Claims**



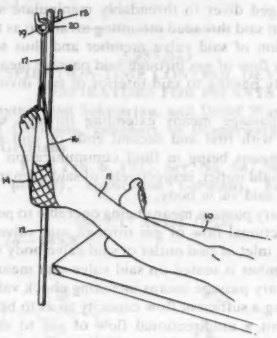
1. A cervical brace including a shoulder embracing portion and a head embracing portion, a part of said head embracing portion extending in the form of a loop so that it may overlie the forehead of a person, said head embracing portion being free from any component for engaging a jaw of a person, and means for pivotably connecting said shoulder and head embracing portions together at three spaced locations, said means including three longitudinally adjustable rigid members each of which having its ends pivotably supported by a discrete portion of said shoulder and head embracing portions.

3,957,041

LEG ELEVATING ASSEMBLY

Joseph R. Wilder, New York, N.Y., assignor to Michael Ebert, Mamaroneck, N.Y., a part interest

Filed Apr. 28, 1975, Ser. No. 572,338
Int. Cl.² A61F 5/40
U.S. Cl. 128—94 7 Claims



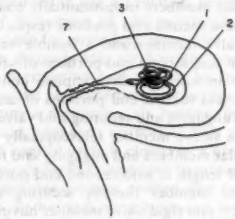
1. In combination with a stand having a head at a position that is raised with respect to a table, a sling for elevating the leg of a patient lying on said table to facilitate medical examination or treatment of the leg, said sling comprising a sterilizable fabric net having a open mesh formation and provided with extensions on either end thereof to define a hammock-like structure, said net being adapted to socket the heel of the patient in a nesting position in which the toes of the foot extend upwardly above the heel and without interfering with blood circulation, and means attached to the ends of the sling to engage the head of the stand, such that when the heel of the patient is nested in the net, the sling conforms to the contours of the foot to securely hold the leg in a raised position without masking the foot, whereby an antiseptic solution may be applied thereto through the interstices of the net.

3,957,042

SPATIAL INTRAUTERINE CONTRACEPTIVE INSERT

Stanislaw Krzaklewski; Andrzej Reszczynski, both of Wroclaw, and Henryk Suski, Warsaw, all of Poland, assignors to Akademia Medyczna We Wroclawiu, Wrolaw, Poland

Filed Apr. 23, 1975, Ser. No. 570,794
Int. Cl.² A61F 5/46; A61M 7/00
U.S. Cl. 128—130 3 Claims



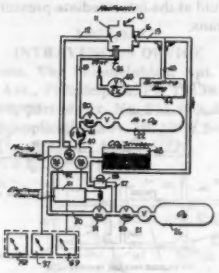
1. A spatial intrauterine contraceptive insert made of an elastic non-reactive plastic characterized by the feature of having two arms, the ends of which are connected permanently and formed into two spatial spirals along the axes that intersect in an acute angle, while near the end of the first loop of each spiral, both arms are immobilized by means of a link made of copper.

3,957,043

RE-BREATHING APPARATUS

William Barney Shelby, 5 Rockbourne St., Elizabeth South, South Australia, Australia (5113)

Filed Aug. 21, 1974, Ser. No. 499,207
Claims priority, application Australia, Aug. 22, 1973, 4578/73
Int. Cl.² A62B 7/02
U.S. Cl. 128—142 G 10 Claims



1. Rebreathing apparatus of the closed circuit type comprising a first gas supply for providing a breathable gas mixture, a second gas supply for providing oxygen alone, a gas circuit, and an electrical circuit,

the gas circuit comprising gas flow control valves coupled to the respective gas supplies and a solenoid valve coupled to the oxygen supply and means for interconnecting the solenoid valve to the breathable gas mixture,

the electrical circuit comprising a pair of transducers in the gas circuit, one said transducer being sensitive to oxygen partial pressure, the other said transducer being sensitive to total pressure, amplifiers controlled by the output of respective said transducers and arranged to amplify respective said outputs, an analogue divider coupling the outputs of said amplifiers, the output of the divider being indicative of percentage of oxygen in the breathable gas mixture, and solenoid driving means coupled to the output of said analogue divider to the winding of the solenoid valve to energise the solenoid valve upon drop in the percentage of oxygen in the gas circuit so as to open the solenoid valve and thereby introduce oxygen from the oxygen supply to the breathable gas mixture.

3,957,044

SELF-CONTAINED BREATHING APPARATUS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of John L. Sullivan, Fort Erie, Canada; Eugene A. Giorgini, Cheektowaga, and Milo R. Simmonds, Williamsville, both of N.Y.

Filed Nov. 11, 1974, Ser. No. 522,971
Int. Cl.² A62B 7/04
U.S. Cl. 128—142.2 3 Claims

1. A breathing apparatus with automatic redundant fluid pressure controls and a low pressure warning device, said apparatus comprising:

first and second conduit means, said first conduit means being adapted to be connected to a source supply of high fluid pressure;

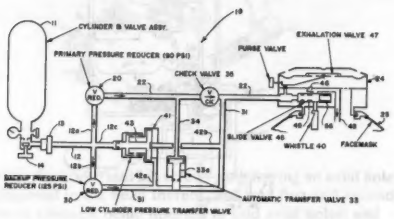
a facemask respirator connected in fluid communication with said second conduit means;

first pressure reducer means interconnecting said first and second conduit means for delivering fluid at a first low pressure to said second conduit means and said respirator means;

third conduit means connected with said second conduit means;

second pressure reducer means interconnecting said first and third conduit means and operable to deliver fluid at an intermediate pressure higher than said first low pressure to said third conduit means;

first pressure transfer means normally closing said third conduit means and responsive to failure of said first pressure reducer means and a drop in pressure in said second conduit means to a predetermined level below said first low pressure to open said third conduit means and communicate fluid at the intermediate pressure to said second conduit means;



second pressure transfer means connected in fluid communication with said first and third conduit means and responsive to a pressure drop of said supply source below a predetermined dangerously low level of pressure to communicate fluid at said intermediate fluid pressure to said second conduit means; and

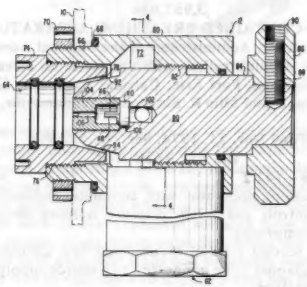
fluid actuated alarm means mounted in said facemask respirator and responsive to delivery of fluid at said intermediate pressure to the respirator upon actuation of said first or second pressure transfer means to thereby signal an alarm and indicate a failure of said first pressure reducer means or the depletion of the gas supply to a dangerously low level.

3,957,045

UNDERWATER BREATHING METHOD AND APPARATUS

Anthony V. Gaudiano, Metairie, La., assignor to Taylor Diving & Salvage Co., Inc., Belle Chasse, La.

Filed Dec. 6, 1974, Ser. No. 530,386
Int. Cl.² A62B 7/00
U.S. Cl. 128—142.3 **2 Claims**



1. An underwater breathing system comprising:

diving helmet means;

a valve body carried by said diving helmet means and having primary passage means extending therethrough with an inlet operable to communicate with a diving gas supply conduit and an outlet operable to transmit said diving gas to the interior of said diving helmet means;

a valve seat means connected with said valve body;

a valve member positioned within said passage means;

threaded mounting means mounting said valve member for threaded movement toward and away from said valve seat means;

a hand knob connected to said valve member for permitting a submerged diver to threadably manipulate said valve member in said threaded mounting means so as to control the position of said valve member and thus selectively regulate a flow of gas through said passage means of said valve body passing to said interior of said diving helmet means;

secondary passage means extending through said valve member, with first and second ends of said secondary passage means being in fluid communication with said inlet and said outlet, respectively, of said primary passage means of said valve body;

said secondary passage means being operable to permit only a unidirectional flow of gas through said valve member from said inlet of said outlet of said valve body when said valve member is seated on said valve seat means;

said secondary passage means including check valve means and having a sufficient flow capacity so as to be operable to transmit a unidirectional flow of gas to said diving helmet means sufficient to maintain at least a minimum subsistence supply of gas therewithin;

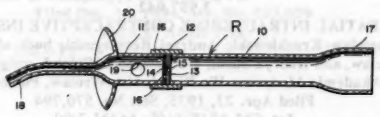
said check valve means being operable to permit said unidirectional control, and prevent an outward flow of gas from said diving helmet means through said secondary passage means when said diving gas supply conduit is severed.

3,957,046

DISPOSABLE MOUTH TO MOUTH RESUSCITATION DEVICE

Arthur M. Harris, Miami Shores, Fla., assignor to Salvatore G. Militana, Miami Shores, Fla.

Filed Nov. 27, 1974, Ser. No. 527,883
Int. Cl.² A62B 7/00
U.S. Cl. 128—145.5 **2 Claims**



1. A mouth to mouth resuscitating device comprising first and second tubular members in substantially coaxial relation and having first and second end portions respectively, a substantially rigid valve member and a flexible valve member mounted between said second end portions of said respective tubular members in substantially complete contact relation with each other, said second end portions of said respective tubular members engaging and securing said valve members at their periphery, a sleeve member telescopically mounted on both of said tubular members and engaging said tubular members along its full length at said second end portions of each respective tubular member thereby securing said tubular members together, said rigid valve member having a centrally disposed opening and disposed transversely adjacent the second end portion of said second tubular member, said flexible valve member having openings out of alignment with said centrally disposed opening and disposed transversely adjacent the second end portion of said first tubular member, the first end portion of each of said tubular members being tapered for insertion into the mouths of persons using this device, the first end portion of said first tubular member being arcuate to extend over and engage the tongue of the person being resus-

citated, said first tubular member having an opening in its side wall adjacent said flexible valve member whereby upon the person performing the resuscitation breathes into the other of said tubular member, said flexible valve member is compelled to flex away from said rigid valve member and upon simultaneously closing off said opening, said air is compelled to flow through said first tubular member and into said person being resuscitated.

3,957,047

RESPIRATION-TIME CONTROL DEVICE IN RESPIRATORS FOR INFANTS

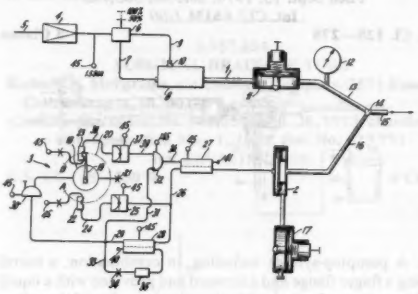
Klaus Freytag, Bad Schwartau, and Detlef Warnow, Lubeck, both of Germany, assignors to Dragerwerk Aktiengesellschaft, Germany

Filed Feb. 6, 1975, Ser. No. 547,501

Claims priority, application Germany, Feb. 8, 1974, 2405955

Int. Cl.² A61M *16/00*

U.S. Cl. 128—145.8 **6 Claims**



1. In a respiration-time control device in respirators for infants of the type including a breathing gas supply line, a branch line connected to the supply line and leading directly to the patient, an expiration line connected to the supply line and the branch line, and a control valve, controlling discharge of expirated breathing gas, in the expiration line and switched between open and closed positions with the aid of said respiration-time control device, the improvement comprising, in combination, a pressure sensitive control means having an actual-value pointer connected to and operable by said pressure-sensitive control means and movable in opposite directions along a path between two limit positions; two air barriers adjustably mounted in spaced relation along said path within the range of movement of said pointer between said limit positions, means for providing respective continuous pneumatic signals through said air barriers, and means on said pointer for interrupting said signals by movement of said pointer across the associated air barrier; one of said air barriers constituting a frequency air barrier; means operatively associating said frequency air barrier with said control valve whereby said control valve is closed by a pressure signal from said frequency air barrier responsive to movement thereacross of said actual-value pointer toward one limit position; the other of said air barriers constituting an inspiration-time air barrier; and means operatively associating said inspiration-time air barrier with said control valve for blocking opening of said control valve by a pressure signal from said inspiration-time air barrier responsive to movement thereacross of said actual-value pointer toward said other limit position and effecting opening of said control valve by a pressure signal from said inspiration-time air barrier responsive to movement thereacross of said actual-value pointer from said other limit position toward said one limit position; whereby the respiration frequency, determined by the constants of the apparatus and the sum of the inspiration and expiration time, is dependent on the position of said frequency air barrier, the inspiration time is determined by the travel of said actual-value pointer from said frequency air barrier to said other limit position and back to said inspiration-time air barrier, the expiration time is determined by the spacing of said two air barriers, and the ratio of the inspiration time to the expiration time is determined by the position of said inspiration-time air barrier between said other limit position and said frequency air barrier.

3,957,048

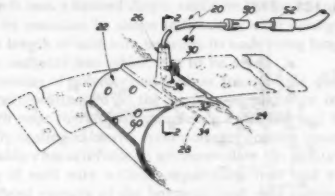
INTRAVENOUS DEVICE

Herbert V. Jacobs, The Philadelphian, Apt. 18BB31, 2401 Pennsylvania Ave., Philadelphia, Pa. 19130

Continuation-in-part of Ser. No. 511,893, Oct. 3, 1974, abandoned. This application Nov. 20, 1974, Ser. No. 525,415

Int. Cl.² A61M *5/32*

U.S. Cl. 128—214 R **7 Claims**



1. An intravenous feeding device comprising strap means for securement to the user, post means fixedly secured to the strap means and having a needle receiving opening, a feeding needle including a main portion having a pointed end and a remote portion extending at an angle to the main portion, said needle being removably received within said opening and freely positionable with respect to said post to enable the main portion thereof to be extended a sufficient distance from said strap means and parallel thereto to permit said main portion to be located centrally within the vein of the user when said strap is secured to said user and irrespective of the distance that said vein lies below the skin of said user, and releasable securement means for securing the remote portion of said needle in said opening and with respect to the post once the main portion of said needle is in position within the vein of the user and the strap is secured to the user.

3,957,049

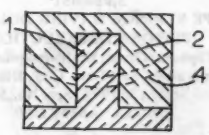
RECHARGEABLE DRUG DELIVERY METHOD

Charles W. Neefe, P.O. Drawer 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 404,352, Oct. 9, 1973, abandoned. This application May 22, 1975, Ser. No. 579,796

Int. Cl.² A61M *7/00*

U.S. Cl. 128—260 **4 Claims**



1. A method of delivering a selected drug to a preselected area of a living body comprising the steps of:

providing a solid receptor chemical compound having an affinity for said selected drug, reducing the solid compound to particles selecting a hydrophillic material permable to the drug when in solution, embedding the particles

of said receptor chemical compound in said hydrophillic material,

attaching said drug to said receptor chemical compound by a reversible bond, and

reversing said bond to permit release the drug from the receptor chemical compound resulting in said drug going into solution within the permeable hydrophillic material,

permitting a timed reversal of said bond release to continue until substantially all the solid phase of said material substantially becomes a solution whereby the drug solution may diffuse to the surface of the permeable hydrophillic material and is released to said preselected area of the living body at a preselected rate.

3,957,050

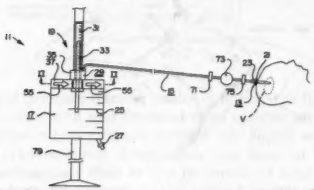
VENTRICULAR DRAINAGE APPARATUS

Robert S. Hines, Jr., 1119 Southwest Ave., Johnson City, Tenn. 37601

Filed May 23, 1975, Ser. No. 580,407

Int. Cl.² A61F *5/44*

U.S. Cl. 128—275 **9 Claims**



1. A ventricular drainage apparatus for positioning intermediate an intraventricular means for insertion into the ventricles of a patient's brain to allow cerebrospinal fluid to pass from the ventricles of the patient's brain and a collection bag means for collecting and storing the cerebrospinal fluid, to control the pressure of the cerebrospinal fluid passing from the intraventricular means to the collection bag; said ventricular drainage apparatus comprising an outer tube member and an inner tube member, said outer tube member having an opened first end and a closed second end, said first end communicating with the intraventricular means for allowing the cerebrospinal fluid to pass into said outer tube member, said inner tube member having an opened first end and an opened second end, said first end being slidably positioned within said outer tube member for allowing the cerebrospinal fluid to pass from said outer tube member into said inner tube member, said second end being positioned within the collection bag means for allowing the cerebrospinal fluid to pass from said inner tube member into the collection bag means when the pressure of the cerebrospinal fluid is sufficient to cause the cerebrospinal fluid in said outer tube member to rise above said first end of said inner tube member.

3,957,051

PUMP-TYPE SYRINGE HAVING DOUBLE-ACTING PISTON CONSTRUCTION

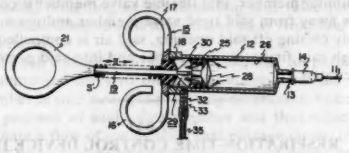
Silas Charles Topham, Orem, Utah, assignor to Medical Development Corporation, Salt Lake City, Utah

Filed Sept. 13, 1974, Ser. No. 505,786

Int. Cl.² A61M *1/00*

U.S. Cl. 128—278 **5 Claims**

1. A pump-type syringe including, in combination, a syringe barrel having a cannula-receiving apertured end, rear finger-retainer means, and a rear closure; a cannula mounted upon said end; a plunger having a shaft sealingly journaled for longitudinal movement in said rear closure and provided with piston means operably disposed within said syringe barrel and so constructed to provide for baffle-type closure during plunger withdrawal strokes and fluid bypass during plunger forward-return strokes, said plunger also having a rearward, enlarged, thumb-depression end; a compression spring operatively interposed between said rear closure and said enlarged



thumb-depression end; and drainage port structure provided said barrel rearward of said piston means for all dispositions of the latter.

3,957,052

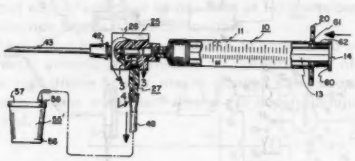
PUMPING-SYRINGE

Silas Charles Topham, Orem, Utah, assignor to Medical Development Corporation, Salt Lake City, Utah

Filed Sept. 13, 1974, Ser. No. 505,785

Int. Cl.² A61M *1/00*

U.S. Cl. 128—278 **8 Claims**



1. A pumping-syringe including, in combination; a barrel having a finger flange and a forward end provided with a liquid orifice communicating with the interior of said barrel; a plunger having a piston sealingly disposed within said barrel and a shank secured to said piston and extending outwardly of said barrel; valving structure integral with said barrel and having a cannula mount provided with a fluid opening, said valving structure defining a rectilinear, primary fluid passageway between said cannula mount at said opening and said liquid orifice, and a first ball valve seat, said valving structure including an ejection passageway intersecting said primary fluid passageway and including a reverse-ejection flow, second valve seat proximate such intersection, a first ball valve operatively disposed and retained in said primary fluid passageway and of greater transverse size than the intersection of said ejection passageway with said primary fluid passageway and also than said liquid orifice whereby said first ball valve is engageable with said forward end as a stop without passing into said liquid orifice, a second ball valve operatively disposed and retained in said ejection passageway and positioned to seal selectively against said second valve seat upon vacuum, withdrawal strokes of said plunger, and a cannula mounted to said cannula mount.

3,957,053

DETACHABLY CONNECTED ACUPUNCTURE NEEDLES

Yen Kong Woo, 1545 Geary St., Apt. 1, San Francisco, Calif. 94115

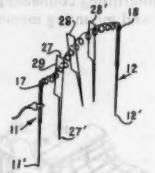
Filed Mar. 3, 1975, Ser. No. 554,537

Int. Cl.² A61H *39/00*

U.S. Cl. 128—303.18 **2 Claims**

1. At least two acupuncture needles of electrically conductive material arranged in closely spaced apart juxtaposition; each of said needles comprising a head having an opening therein, a body porton of relatively small cross-section and a pointed tip of a size for penetrating the skin of a person to reach weakened muscles and nerve areas in the nose and ear and upper lip of the mouth of the body, a flexible connector

of electrically conductive material in convolute form having its opposite ends hooked through the openings in said juxtaposed needles enabling operatively positioning of said needles relative to one another within a radii of 360°, and at least one



additional needle of electrically conductive material and comprising a head, a body portion of relatively small cross-section and a pointed tip of a size for penetrating the skin of a person removably secured proximate its head witin the convolutions of said flexible connector.

3,957,054

SURGICAL DRAINAGE TUBE

Richard H. McFarlane, c/o Coilform Company, 2571 Kaneville Court, Geneva, Ill. 60134

Continuation of Ser. No. 401,051, Sept. 26, 1973, abandoned. This application May 1, 1975, Ser. No. 573,771

Int. Cl.² A61M 27/00

U.S. Cl. 128—350 R **4 Claims**

1. As an article of manufacture, a surgical drain for a wound comprising a length of flexible, pliable, rubbery, medical grade material which is radio opaque defining a thin tubular wall having a first end to be inserted through the wound into a human body and extended with the second end extending out of the wound, said wall having a cylindrical, smooth, exterior surface and a collapsible passageway therethrough which is normally of oval cross section and is adapted to be flattened in response to externally applied surface pressure, so as to be substantially flat, said tubular wall having a plurality of flexible, pliable laterally yieldable longitudinally ribs of rubbery material along the length thereof and extending depthwise into said passageway whereby, when said length is used as a drain, said passageway is not collapsed into a completely closed condition by normal pressures within the body, said ribs being equi-spaced about said passageway and extending into said passageway so that, when a radially inwardly directed force is exerted upon the exterior surface of said tubular wall, the wall will collapse with the terminal ends of the ribs of rubbery material engaging the confronting interior surface of the tube so as to define a plurality of adjacent yieldable internal capillary passageways, said tube length being of uniform cross section throughout the length thereof between said ends and said ribs being integral with said tubular wall, and said ribs extend into said passageway a substantially common distance in perpendicular relation to the tubular wall and said surfaces of said ribs extending into said passageway are substantially parallel to one another.

3,957,055

CATHETER GUIDE

Gerald S. Linder, 16693 Charmel Lane, Pacific Palisades, Calif. 90272, and Harry Zimmerman, 12941 La Maida St., Sherman Oaks, Calif. 91423

Filed Sept. 23, 1974, Ser. No. 508,173

Int. Cl.² A61M 25/00

U.S. Cl. 128—351 **4 Claims**

1. A catheter guide in stylet form adapted for insertion into and withdrawal from a catheter comprising in combination:

a. a wire of substantially uniform diameter composed of material sufficiently flexible to be configured by the hands into a desired shape, said wire having enough rigidity to maintain its shape indefinitely after configuration, the length of said wire between its ends being longer than the catheter into which it is to be used;

b. a coating of polymer material, as, for example, polyolefin, securely attached to the surface of said wire including both ends thereof for completely enclosing and hermetically sealing said wire, said polymer coating possessing a pliable characteristic to accommodate the desired bending of said wire without separation from said wire and without rupture of the hermetic seal, said polymer coating having a smooth, self-lubricating surface to reduce friction during the insertion into and withdrawal of the coated wire from the catheter; and

c. an adjustable stop of resilient material having a shoulder portion and a rear surface, said stop further having a central bore extending therethrough between the shoulder portion and the rear surface, said bore being of a size at the rear surface opening to receive at least two diameters of said coated wire said stop being slideably mounted on said coated wire for establishing the depth of penetration of one end of said coated wire into the catheter by the abutment of the shoulder portion of said stop against the open end of the catheter, the other end of said coated wire being adapted for insertion into the said opening at the rear surface of said stop for forming a handle.

3,957,056

POWER-SOURCE CANISTER

Richard H. Comben, Minneapolis, and Richard L. Doty, White Bear Lake, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 25, 1974, Ser. No. 526,590

Int. Cl.² A61N 1/36

U.S. Cl. 128—419 R **37 Claims**

1. In a power source canister for isolating a power source from the means to be powered when packaged therewith for

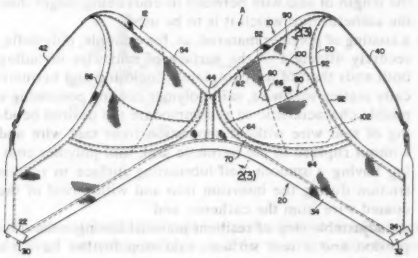
implantation in a living animal body, and having a bottom wall, a continuous side wall, a cover and feed-through means for allowing an electrical connection between a power source within said canister and the device or devices to be powered, the improvement wherein said bottom wall and side wall define a cavity, said cover being at least coextensive with said cavity, and further comprising flange means extending from said side wall and away from said cavity, said side wall being formed by four generally straight portions of approximately equal length, each straight portion being generally perpendicular to two of the others and generally parallel to a third, and said straight portions being joined by arcuate portions having a radius of curvature approximately equal to one-fourth the distance between said parallel straight portions.

3,957,057

BRASSIERE

Frank G. Farino, Shaker Heights, Ohio, assignor to Leading Lady Foundations, Inc., Cleveland, Ohio

Filed Sept. 8, 1975, Ser. No. 606,857
Int. Cl.² A41C *3/10*
U.S. Cl. 128—478 **11 Claims**



1. In a mastectomy brassiere including two breast cups each adapted to receive either a natural breast or a mastectomy form pad, each of said breast cups having two peripheral upwardly tapering non-elastic margin strips, a lower curved margin strip connecting said tapered margin strips, an outer non-elastic fabric cover with a desired breast forming contour and a retaining means generally spaced from fabric cover to form a pocket for a mastectomy form pad, the improvement comprising: said retaining means including first and second separate stretchable flaps, said first stretchable flap being secured along one of said marginal strips and along said lower strip, said second flap secured along the other of said marginal strips and along said lower strip, and said flaps overlapping at said lower strip to define an upper, generally triangular access opening for a mastectomy form pad.

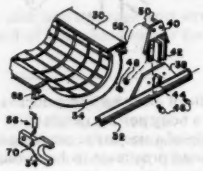
3,957,058

DETACHABLE MOUNT FOR CONCAVE OF AXIAL FLOW COMBINE

John J. Komancheck, New Holland, Pa., assignor to Sperry-New Holland, New Holland, Pa.

Filed Mar. 14, 1975, Ser. No. 558,507
Int. Cl.² A01F *12/28*
U.S. Cl. 130—27 J **7 Claims**

1. In an axial flow combine having a rotor mounted for rotation in the threshing and separating compartment thereof and co-acting with a concave complementary in shape to the lower portion of said rotor, said concave having a forward and rearward end, means in said compartment engageable with the rearward end of said concave to support it operatively relative to said rotor, and a mounting member positioned in said combine adjacent the lower portion of the forward end of said concave and extending transversely across said compartment below the forward end of said concave, the improvement comprising supporting means carried by said mounting member and engageable with the forward end of said concave to support it relative to the forward end of said rotor, said supporting means comprising bracket means extending upward from said mounting member and the upper end of said bracket means and one side of the forward end of said concave having readily detachable interfitting connection means, additional readily detachable interfitting connecting means between said bracket means and said mounting member operable to interconnect said bracket means detachably to said mounting member, and further readily detachable interfitting connecting means between said mounting member and the other side of the forward end of said concave, whereby when said aforementioned interfitting connecting means are disengaged from each other said bracket means may be detached from said mounting member and said concave may be moved forwardly to separate the same from said combine.



3,957,059

SMOKING PRODUCT AND PROCESS

Norman B. Rainer, and Peter Allen Wilson, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Feb. 10, 1975, Ser. No. 548,240
Int. Cl.² A24B *15/027*; A24D *1/04*; A24F *25/00*
U.S. Cl. 131—10 R **16 Claims**

1. A composition comprising activated alumina impregnated with sodium permanganate and a basic sodium compound, said alumina containing less than about 6% by weight of silica based on said alumina, said alumina also having a surface area of at least about 100 m^2/gm and a pore volume of at least about 0.2 cc/gm, said sodium permanganate being present in an amount from about 5 to about 30% by weight of said composition, said basic sodium compound being present in an amount such that the molar ratio of said basic sodium compound to said sodium permanganate is from about 1/0.5 to about 1/20, said composition having a moisture content of from about 5 to about 30% by weight based on said composition.

3,957,060

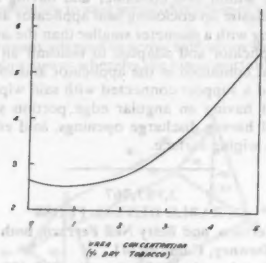
TOBACCO TREATMENT

Richard P. Newton, Jr., and Robert Reiner Johnson, both of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Nov. 23, 1971, Ser. No. 201,452
Int. Cl.² A24B *3/14*, *13/00*, *15/08*
U.S. Cl. 131—17 R **4 Claims**

1. A tobacco product produced from a tobacco treated with an organic material selected from the group consisting of urea and biuret in an amount within the range of from about 1.25%

to about 5% by weight which has no significant chemical effect upon the unburned tobacco but which is sufficient to



increase the level of strength perception of the smoke resulting from burning of the tobacco.

3,957,061

AROMATIC COMPOSITIONS

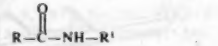
Edouard P. Demole, Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

Division of Ser. No. 219,136, Jan. 19, 1972, Pat. No. 3,840,023. This application June 24, 1974, Ser. No. 482,557

Int. Cl.² A24B *3/14, 13/00, 15/08*

U.S. Cl. 131—17 R **2 Claims**

1. A process for improving, enhancing or modifying the organoleptic properties of a tobacco product, which comprises adding thereto about 1 to about 1000 parts per million based on the weight of tobacco of at least one compound selected from the group of compounds having the formula



wherein R and R¹ represent an alkyl radical comprising 1 to 6 carbon atoms, or a hydrogen atom.

3,957,062

CIGARETTE MAKING MACHINES

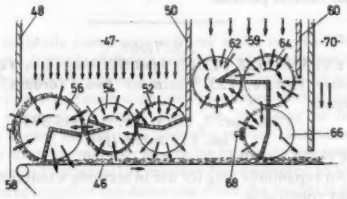
Francis Auguste Maurice Labbe, Neuilly-sur-Seine, France; Brian A. Hodsall, and Edward George Preston, both of London, England, assignors to Molins Limited, London, England

Filed June 24, 1974, Ser. No. 482,130

Claims priority, application United Kingdom, June 29, 1973, 30997/73

Int. Cl.² A24B *5/04, 5/08*

U.S. Cl. 131—84 B **14 Claims**



1. A cigarette making machine for making cigarettes containing a core of material different from that of a surrounding annulus of tobacco, comprising a conveyor arranged for travel along a predetermined path, means for forming a continuous substantially flat initial layer of tobacco having a predetermined width on the conveyor, means for feeding a core having a width narrower than said predetermined width of said initial layer onto the initial layer of tobacco at a position along said path such that portions of said initial layer at opposite sides of said core are not covered by said core, side walls for at least partially confining the opposite sides of the core and extending downstream from said position along a predetermined portion of said path, and means for feeding further tobacco onto said side portions of the initial layer while the core is being confined by the side walls along said predetermined portion of said path to form a filler stream.

3,957,063

METHOD AND APPARATUS FOR INCREASING THE VOLUME OF MOIST TOBACCO

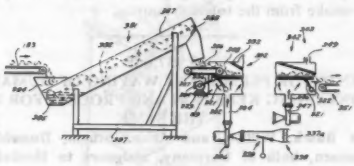
Waldemar Wochnowski, Hamburg, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Division of Ser. No. 220,848, Jan. 26, 1972, Pat. No. 3,881,498. This application Apr. 19, 1974, Ser. No. 462,522

Claims priority, application Germany, Jan. 27, 1971, 2103669

Int. Cl.² A24B *1/02, 3/02, 9/00, 15/00*

U.S. Cl. 131—140 P **7 Claims**



1. A method of increasing the volume of tobacco, comprising the steps of subjecting tobacco to an intensive moistening action with attendant expansion of tobacco; subjecting the thus expanded tobacco to a short-lasting external heating action which is sufficient to effect the drying of tobacco in the outer strata immediately adjacent to the external surfaces of tobacco; stopping said external heating so that the hardness of said outer strata substantially exceeds the hardness of the inner strata of tobacco; and thereupon subjecting the thus externally heated tobacco to a cooling action with resulting pronounced stabilization of the volume of tobacco, including effecting a force exchange of heat between tobacco and a fluid coolant.

3,957,064

MOUTHPIECES TO FACILITATE GIVING UP SMOKING

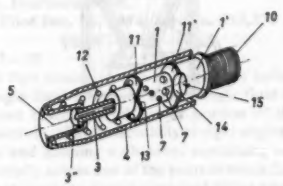
Don Jose Maria Camps Mestre, and Don Manuel Tremoleda Dilmer, both of Calle Londres No. 27, Barcelona, Spain

Filed Apr. 15, 1975, Ser. No. 568,185

Claims priority, application Spain, Apr. 19, 1974, 425730

Int. Cl.² A24F *1/10, 47/00*

U.S. Cl. 131—171 A **7 Claims**



1. A mouthpiece to facilitate giving up smoking having:
a diluting means for diluting smoke and air with additional air having an axial bore with at least one opening from said bore to the exterior of said diluting means;

a restricting means for restricting said opening movably mounted in said bore and extending axially beyond said bore;

a metallic sleeve enveloping said diluting means, moveably mounted on said diluting means, and defining a recess adapted to hold a tobacco source; and

an end body connected to said diluting means and adapted to be partially introduced into a smoker's mouth;

the improvement comprising the diluting means being a body with an axial bore having three zones of differing diameters, the first zone being the least diameter and internally threaded for attaching an axially bored stem for mounting said metallic sleeve to said diluting means, the second zone being internally threaded for mounting said restricting means and containing said opening in the form of an axiallyspaced plurality of orifices, the third zone being of largest diameter and having a smooth bore; two peripheral ribs on the exterior of said body, said ribs being the sole external contact locations for the mounting of said metallic sleeve; said plurality of orifices opening into the space defined between said ribs, and the rib closest to said third zone having at least one cutout through which said additional air can enter the annular space between said metallic sleeve and said body to dilute smoke from the tobacco source.

3,957,065

AGENTS FOR PERMANENT WAVING OF HUMAN HAIR CONTAINING KERATEIN AND PROCESS FOR USING THE SAME

Peter Busch, Willich, and Alfons Sturm, Dusseldorf-Holthausen, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Sept. 5, 1974, Ser. No. 503,250

Claims priority, application Germany, Sept. 10, 1973, 2345621

Int. Cl.² A45D *7/04*

U.S. Cl. 132—7 **12 Claims**

7. In a process for permanent waving hair comprising applying a permanent waving agent containing a hair-softening agent to the hair, at a temperature and for a time effective to permanently wave said hair, applying an oxidizing fixing agent to the hair, and removing said agents from the hair; the improvement which consists essentially in utilizing from 1% to 10% by weight of keratein in said permanent waving agent containing a hair-softening agent.

3,957,066

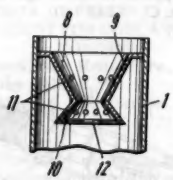
COSMETIC STICK

Klaus-Peter Dahm, Stettiner Strasse, Rethen, Germany (3011)

Filed Jan. 9, 1975, Ser. No. 539,735

Int. Cl.² A45D *40/26*

U.S. Cl. 132—88.7 **1 Claim**



1. A cosmetic stick, comprising a rigid cylindrical container for a liquid colorant, a cap closing said container, an inner shaft extending into said container and having an end connected with said cap, a pencil-shaped carrier connected with the other end of said shaft, an applicator enclosing said carrier and consisting of plastic foam with open cells for receiving and storing the liquid colorant, said carrier having upon its outer surfaces projections engaging said applicator, the outer diameter of said applicator being smaller than that of said shaft, a wiper located within said container and having elastic lips, including an elastic lip enclosing said applicator and having a central opening with a diameter smaller than the outer diameter of the applicator and adapted to transmit an amount of liquid colorant contained in the applicator and suitable for a single use, and a support connected with said wiper and said container and having an angular edge portion surrounding said shaft and having discharge openings, said edge portion constituting a wiping surface.

3,957,067

DURABLE DENTAL FLOSS

Kenneth N. Ferraro, and Betty Nell Ferraro, both of 7900 E. 4th Place, Downey, Calif. 90241

Filed Apr. 16, 1975, Ser. No. 568,407

Int. Cl.² A61C *15/00*

U.S. Cl. 132—89 **6 Claims**

1. A dental floss consisting essentially of an aramid.

3,957,068

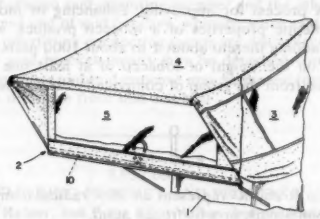
QUICK DETACHABLE ESCAPE FASTENER

William F. Cox, Grifton, N.C. 28530

Filed Mar. 10, 1975, Ser. No. 556,916

Int. Cl.² A45F *1/12*; E05B *65/10*

U.S. Cl. 135—15 CF **5 Claims**



1. In a camping unit enclosed at least partially by walls and top in which a wall of flexible material extends over the outer side of a rigid frame member, a quick detachable escape fastener comprising spaced, slotted tubular formations on the outer side of said frame member, a folded edge of said wall inserted through the slots in said tubular formations, a flexible member in said folded edge portion within said tubular formations to prevent withdrawal of said edge portion through said slots, said flexible member having a central portion accessible through an opening in said edge portion on the interior side of said end wall and in space between said tubular formations, so that said flexible member may be quickly removed by a pull on said central portion.

3,957,069

EXPANDIBLE PLUGS FOR SECURING A TENT

Salvatore Denaro, 133 Westmont Ave., Toronto, Ontario, Canada

Filed Apr. 7, 1975, Ser. No. 565,399

Int. Cl.² A45F *1/16*

U.S. Cl. 135—15 PE **5 Claims**

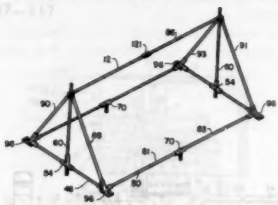
1. An expandible plug for use in securing a tent frame to the ground comprising:

a lower plug means consisting of two symmetrical semi-circular portions, the inside surfaces of which are screw-threaded, and the outer diameter of said lower plug means being reduced towards the lowermost part and terminating in a point, the inner diameter of said lower plug means tapering inwardly to the point where the outer diameter diminishes, said lower plug means having a fixed

ring circumferentially affixed to the upper portion of said plug means and an expandible ring circumferentially affixed to the lower portion of said plug means;

a screw means consisting of a uniform cylindrical screw complementary to said screw-threading of said lower plug means;

a handle means adapted to screw said screw means into said lower plug means whereby the lower portion of said lower



plug means expands when said screw means is inserted into said lower plug means;

means adapted to secure the frame of the tent to said expandible plug comprising a base plate with a hole therethrough through which the screw means is inserted into said lower plug means, and three short hollow tubes affixed to said base plate adapted to receive respective portions of the tent frame.

3,957,070

UMBRELLA

Josef Pieper, and Ursula Pieper nee Piseberg, both of Wuppertal, Germany, assignors to Bremshey Aktiengesellschaft, Solingen, Germany

Filed Jan. 9, 1975, Ser. No. 539,810

Claims priority, application Germany, Jan. 10, 1974, 2401067

Int. Cl.² A45B *25/18*

U.S. Cl. 135—33 R **5 Claims**

1. An umbrella comprising a frame and a cover of flexible material the frame including a telescopic stick, a crown at one end of the stick, a plurality of dome ribs extending radially from the crown and each supported by a support structure, the support structure for each dome rib including at least a stretcher means hinged to a common runner slidable on the stick, the stretcher member also being hinged to the dome rib, the runner and the stretcher member being adapted to shorten the effective length of the dome ribs when the runner is moved towards the crown, the cover being supported on the dome ribs and being attached centrally to the crown and peripherally to each end of the dome rib ad at an intermediate attachment point on each dome rib, the flexible material of the cover including radially extending stiffened areas between the crown and the intermediate attachment points, the radially extending stiffened areas each having a hinged portion separating the stiffened portions into a first stiffened section and a second stiffened section in radial alignment such that when the umbrella is being collapsed, and the runner moves toward the crown the intermediate attachment points on the dome ribs will move radially towards the crown, the second stiffened portions will fold under the first stiffened portions whereby the cover portion between the intermediate points and the crown will form a spread foldable mushroom shape, the total radial length of the stiffened areas and the hinged gap between the stiffened areas being equal to the distance from the periphery of the crown to the attachment point on the dome rib when the umbrella is extended.

3,957,071

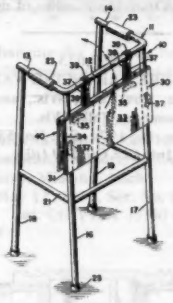
CARRIER ATTACHMENT FOR INVALID WALKERS

M. Beatrice Kenner, 6300 Linway Terrace, McLean, Va. 22101

Filed Sept. 10, 1975, Ser. No. 612,037

Int. Cl.² A45B *3/00*

U.S. Cl. 135—47 **7 Claims**



1. A carrier attachment for invalid walkers of the type including a U-shaped upper frame member having a bight portion and a pair of arms supported adjacent its corners and free ends by generally upstanding rigid legs, which attachment comprises spaced apart suspension straps encircling said U-shaped frame at spaced points therealong, a rigid traylike supporting means attached along one of its sides to one end of said suspension straps, said traylike means having a length sufficient to bridge the arms of said U-shaped frame, a pocket section attached to the other ends of said suspension straps and constructed with at least one pocket on the side thereof facing the interior of the walker, and fastener means on said suspension straps to define loops encircling said U-shaped frame.

3,957,072

FLUID FLOW CONTROL VALVE

Eric D. Ellsworth, Allen Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 16, 1974, Ser. No. 533,372

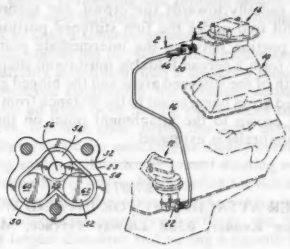
Int. Cl.² F16K *17/36*

U.S. Cl. 137—38 **5 Claims**

1. A fluid flow control device comprising a hollow housing having a single fluid inlet port and a single fluid outlet port axially aligned therewith, the major portion of the housing extending laterally of and essentially at right angles to the axis of the ports and defining a chamber containing valve means movable laterally across one of the ports to block flow through the same in response to a predetermined tilting angular movement of the housing in either direction about the axis of the ports from an initial position,

said chamber having a clover-like shape with a plurality of modes extending at angles to each other, the ports being located in one of the nodes, the valve means being lo-

cated in the remaining of the plurality of nodes and movable therefrom into the one node,



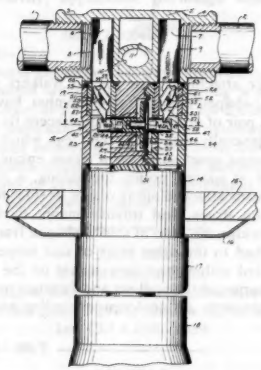
the valve means comprising a number of valves greater than one and one less than the number of nodes.

3,957,073

PRESSURE BALANCING VALVE

Thomas G. Barnum, Fox Point, Wis., assignor to Bradley Corporation, Menomonee Falls, Wis.

Filed Dec. 16, 1974, Ser. No. 533,159
Int. Cl.² G05D *11/03*
U.S. Cl. 137—87 **13 Claims**



1. A pressure balancing valve comprising:

a body having two spaced, substantially straight fluid ducts, a cavity intermediate the ducts, guideways leading from each duct into the cavity that are transverse to the ducts, and pressure canals leading from each duct into the cavity that are also transverse to the ducts;

a pressure sensor including a flexible pressure responsive member dividing the cavity that is mounted for axial movement within said guideways in a direction transverse to said ducts and which extends into each of said fluid ducts; and

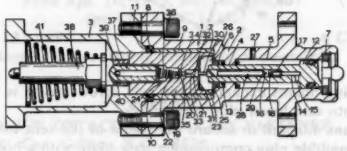
a pair of butterflies, each positioned in one of said fluid ducts and cooperatively engaged with said pressure sensor to be moved upon axial movement thereof, such butterflies being upstream from said pressure canals.

3,957,074

CONTROL VALVE ASSEMBLIES FOR VEHICLE HYDRAULIC BRAKING SYSTEMS

Philip Augustus Taft, Solihull, England, assignor to Girling Limited, Birmingham, England

Filed Apr. 26, 1974, Ser. No. 464,302
Claims priority, application United Kingdom, May 2, 1973, 20948/73
Int. Cl.² G05D *16/10*; F15B *13/14*
U.S. Cl. 137—102 **1 Claim**



1. A control valve assembly for a vehicle braking system comprising a cylinder body having a longitudinally extending bore, a first positively actuated piston responsive to an applying force and working in said piston bore, said first piston being movable between a retracted position and an operative advanced position, a second floating piston working in said piston bore in a position in advance of said first piston, a pressure space defined in said piston bore between said pistons, a first valve controlling communication between a port for connection to a reservoir for fluid and said pressure space, said first valve being movable between a normally open position and a closed position in response to movement of said first piston away from said retracted position, a second valve controlling communication between said pressure space and a passage for connection to a source of fluid under pressure, said second valve being movable between a normally closed position and an open position in response to movement of said first piston away from said retracted position but subsequent to movement of said first valve into said closed position, said first piston being provided with a longitudinal valve bore interconnecting said first and second valves, said first valve comprising a first seating in said second piston, a first ball for engagement with said first seating, and a stop member carried by said first piston for holding said first ball away from said first seating when said first piston is in said retracted position, said stop member comprising a retaining ring provided with an aperture through which said first ball engages said first seating, said second valve comprising a second seating in said first piston at the end of said valve bore remote from said first valve, and a second ball for engagement with said second seating and normally engaged therewith by fluid under pressure from said source when said first piston is in said retracted position, and an unbiassed valve-operating member common to and separate from both said balls guided to slide in said valve bore, said valve-operating member being so constructed and arranged that said second ball re-engages with said second seating and said first ball is subsequently moved away from said first seating when said first piston is returned to said inoperative position in response to pressure remaining in said pressure space.

3,957,075

FLOW-SENSITIVE PRESSURE LIMITING VALVE FOR HYDRAULIC EQUIPMENT

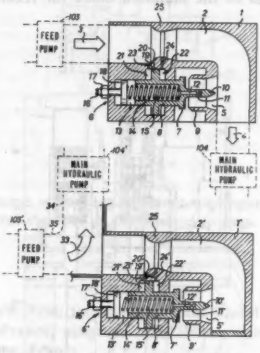
Max Kunz, Meyrin, and Kurt Christiansen, Oberbuchsiten, both of Switzerland, assignors to Von Roll AG, Gerlafingen, Switzerland

Filed Apr. 2, 1975, Ser. No. 564,339

Claims priority, application Switzerland, Apr. 9, 1974, 4943/74

Int. Cl.² G05D *7/01*

U.S. Cl. 137—117 **4 Claims**



1. Pressure limiting valve for limiting the pressure in a hydraulic system by reference to the force of a spring and also to a flow-induced pressure difference in the hydraulic system, comprising:

a valve seat (**9**) and a spring-pressed valve plate (**7**) arranged to block a passage between a part of a hydraulic system in which the pressure is to be limited and a relief line except when the spring is compressed by effect of hydraulic pressure;

A guide piston (**8**) attached to said valve plate and mounted in a housing providing a chamber (**13**) at the end of said guide piston remote from said valve plate, a bore being provided through said valve plate for connecting said chamber with said part of said hydraulic system;

a pressure piston (**19**) in force-transmitting relation to said guide piston (**8**) arranged in a cylinder cavity (**20**) so as to divide it into two chambers (**21,22**), and

duct means for connecting the respective chambers of said cylinder cavity to two different zones of a constriction in said hydraulic system which are at different pressure when there is substantial hydraulic flow through such constriction, whereby the amount of said flow is caused to shift the pressure limiting threshold of the valve.

3,957,076

MONORAIL TRANSPORTATION SYSTEM

Will B. Jamison, Bethel Park, and Eston F. Petry, McMurray, both of Pa., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Filed Apr. 18, 1974, Ser. No. 462,154

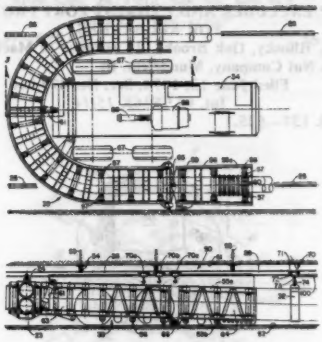
Int. Cl.² H02G *11/00*; **B65G** *53/30*

U.S. Cl. 137—344 **2 Claims**

1. In a conveyer for transporting a slurry hose means supported from an overhead monorail through a 180° turn wherein said conveyer has a bottom frame means formed through a 180° arc and an input ramp and an output ramp, and first roller means radially journaled along said bottom frame, said conveyer comprising:

a. first and second side frame means pivotally attached to each side of said bottom frame means to permit said side frame means to swing angularly with respect to the axis of said overhead monorail;

b. a plurality of second roller means journaled in said first and second side frame means; and



c. means for changing the distance between said bottom frame first roller means and said overhead monorail.

3,957,077

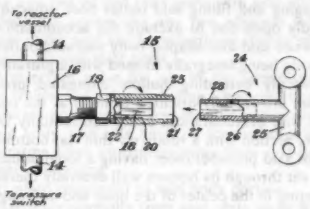
VALVE AND MEANS FOR OPERATING THE VALVE

George Victor Grandjean, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 12, 1975, Ser. No. 576,498

Int. Cl.² F16K *35/00*

U.S. Cl. 137—383 **3 Claims**



1. In combination, a valve, and a key member for operating the valve, the combination including:

a valve body including a bore for carrying fluid through the valve;

a valve closure which is positioned in the valve body;

a valve stem housing which is mounted on the valve body, and which includes an upper end;

a valve stem which includes an upper and lower end, the stem being rotatably carried in the stem housing, the lower end of the stem being attached to the valve closure, and the stem being rotatable to move the valve closure to an open position which permits fluid flow through the valve bore, and to a closed position which will block fluid flow through the valve bore;

a tubular member which includes an upper and lower end, the lower end being fastened to the upper end of the valve stem housing, the tubular member having a bore which encloses the upper end of the valve stem, and the tubular bore including an internal fastener means defined within the bore;

a key member which is defined by a handle and a shank portion, the shank including a bore therein which is adapted to engage the upper end of the valve stem, to enable the valve stem to be rotated by the key member, the shank including an external fastener means which is

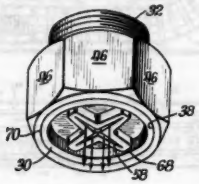
adapted to engage the internal fastener means of the tubular member while the valve stem is being rotated.

3,957,078

WASP EXCLUDER AND EXHAUST PORT PROTECTOR FOR AIR BRAKES

Emil J. Hlinsky, Oak Brook, Ill., assignor to MacLean-Fogg Lock Nut Company, Mundelein, Ill.

Filed June 13, 1974, Ser. No. 479,040
Int. Cl.² F16K 15/14
U.S. Cl. 137—525.1 7 Claims



1. A wasp excluder and exhaust port protector for air brakes comprising:

a housing having inlet and outlet end portions with a passageway therebetween, said inlet end portion having means for connection to an exhaust port of an air brake system, said outlet end portion having an outlet bore with an outwardly open end;

a valve having a generally flat disc shaped body of rubber-like material recessed within said outlet end portion to provide mechanical protection therefor from external flying objects such as railroad ballast, said valve body engaging and filling said outlet bore adjacent said outwardly open end to exclude the accumulation of solids between said disc-shaped body and said outlet bore;

said body being integrally formed with a plurality of axially outwardly extending hollow elongated protuberances which are radially oriented to meet at the center of the disc, the protuberances being substantially U-shaped in cross-section with a relatively thin flat bottom,

each of said protuberances having a longitudinally extending slit through its bottom wall centrally thereof, the slits meeting in the center of the body and defining a plurality of elastic sectors sealingly engaged in edgewise abutment along the slits by the elasticity of the material to prevent entrance into and blockage of said passageway by outside agents such as wasps and ice, said body being deflectible by internal air pressure to axially outwardly deflect said elastic sectors and open said slits toward said outwardly open end to thereby dislodge any accumulation of solids on the outer surface thereof and enable flow of air through said passageway, the outer surface of said hollow protrusions being within but adjacent the outlet end portion,

whereby initial opening of said slits by air pressure is characterized by outward angular deflection of said sectors and simultaneous separation of edges of said sectors along the slits to dislodge material collected thereon.

3,957,079

VALVE ASSEMBLY FOR A SUBSEA WELL CONTROL SYSTEM

Jack Whiteman, Houston, Tex., assignor to C. Jim Stewart & Stevenson, Inc., Houston, Tex.

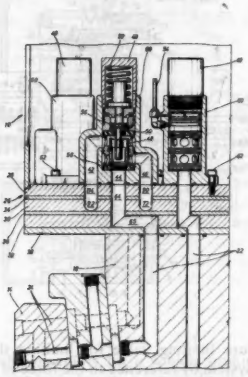
Filed Jan. 6, 1975, Ser. No. 538,644
Int. Cl.² F15B 13/08
U.S. Cl. 137—596.18 8 Claims

1. In a subsea control system for providing hydraulic control of underwater equipment and having a female member adapted to be connected to the underwater equipment and having a retrievable male member coacting with the female member, said male and female members each including a plurality of fluid control passageways therethrough, the improvement in a valve assembly for controlling the flow of hydraulic fluid through the control passageways comprising,

a plurality of pilot operated control valves each having an inlet, an outlet, and a vent port,

a laminated manifold block having top, middle and lower layers, said valve block being connected to the top of the male member,

a plurality of individual valve housings releasably secured to the top layer of the manifold block for receiving said



control valves, each of said housings having a pilot control line connection,

a plurality of outlet passageways extending through the top, middle and lower layers of the manifold block providing communication between one of the outlets of one of the control valves and one of the fluid passageways in the male member,

said middle layer of the manifold block including a fluid supply manifold which extends through the top layer to each of the inlet ports of the control valves, and

said middle layer of the manifold block including a fluid exhaust manifold which extends through the top layer to each of the vent ports of the control valves.

3,957,080

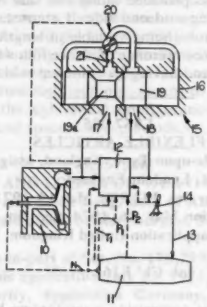
PRIMING VALVE FOR LIQUID FUEL SUPPLY SYSTEM

Geoffrey Arthur Lewis, Solihull, England, assignor to Lucas Aerospace Limited, Birmingham, England

Filed Aug. 29, 1974, Ser. No. 501,488
Claims priority, application United Kingdom, Oct. 10, 1973, 47286/73
Int. Cl.² F16K 19/00; F02K 3/06
U.S. Cl. 137—599 4 Claims

1. A priming valve arrangement for a liquid fuel supply system, said valve arrangement comprising a housing, a bore in said housing, inlet and outlet ports in the housing, said ports communicating with said bore, a control element slidable within said bore between first and second positions, in both of which said outlet port is isolated from said inlet port, said ports being interconnected during movement of said element between the two said positions thereof, said control element defining first and second chambers in said bore, one of said chambers communicating with said inlet port, whereby a fuel pressure in said inlet port provides an operating pressure in

said one chamber to move said control element between its first and second positions, and a flow restrictor through which



a fuel volume, whose displacement accompanies movement of said control element, is constrained to pass.

3,957,081

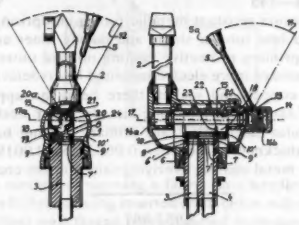
MODIFIER

Daniel DeWavrin; Janusz Nitecki, and Lionel Bourbotte, all of Paris, France, assignors to Etablissements P. Piel Societe Anonyme, France

Filed Jan. 16, 1974, Ser. No. 433,787

Int. Cl.² F16K *11/06*

U.S. Cl. 137—625.4 **5 Claims**



1. A mixing valve comprising;

a valve body having two fluid inlets adjacent one another and having a fluid outlet opposite the inlets;

first and second flat plates located in the valve body in mutually overlying contact, both overlying said inlets and both located opposite said outlet, the first plate having two inlet orifices of rectangular shape extending through the plate in fluid communication with said fluid inlets respectively, one of said inlet orifices having edges aligned with edges of the other inlet orifice and spaced apart by a longitudinal distance, and the second plate having a single, elongate outlet orifice of rectangular shape extending through the plate in fluid connection with said fluid outlet and having longitudinal edges disposed longitudinally of the two inlet orifices, the outlet orifice being longer than either of the outlet orifices and being longer than said distance; and

a member mounted in the valve body for sliding and turning and for thereby moving and guiding said one plate to slide it longitudinally and transversally of the edges, while keeping corresponding edges of said orifices parallel to one another, to selectively establish and interrupt overlapping of the outlet orifice with one and with both of the inlet orifices.

3,957,082

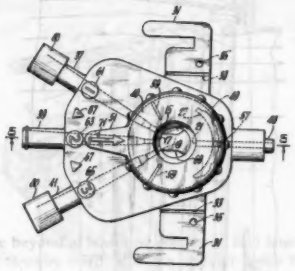
SIX-WAY STOPCOCK

Robert Lee Fuson, North Branch, N.J., and Wesley S. Larson, Enfield, Conn., assignors to Arbrook, Inc., Arlington, Tex.

Filed Sept. 26, 1974, Ser. No. 509,363

Int. Cl.² F16K *11/02*

U.S. Cl. 137—625.41 **16 Claims**



1. A selection valve for use in the administration of intravenous fluids comprising:

a body having a cylindrically shaped cavity, said body including at least three inlet ports and an outlet port extending through its cylinder wall; and

means disposed within said body cavity for selectively connecting any one of said inlet ports with said outlet port, for selectively connecting any two adjacent inlet ports with said outlet port and for selectively closing off, simultaneously, all said inlet ports.

12. In a selection valve for use in the administration of intravenous fluids, said valve including a body portion having input and output ports, and a movable gate portion cooperating with said body, said gate having a transverse passageway and an operating knob protruding away from said body, the improvement comprising:

a support plate connected to said body portion;

a skirt extending normally from said plate away from said gate operating knob a distance greater than the body portion, said skirt being located at a periphery spaced from said body portion;

a plurality of connection tubes attached one each to each of said body input and output and to said support plate and said skirt, each of said tubes extending beyond said skirt; and

means connected to said skirt for conforming to the surface shape of a mounting object.

3,957,083

PRESSURE SENSITIVE REGULATING VALVE

Elia A. Gallo, League City, Tex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 27, 1975, Ser. No. 544,457

Int. Cl.² F16K *15/14*

U.S. Cl. 138—43 **3 Claims**

1. A pressure sensitive valve for use within a conduit for regulating the flow therethrough, said valve comprising a spring, said spring being secured at one end thereof within said conduit, a baffle mounted on the other end of said spring, said

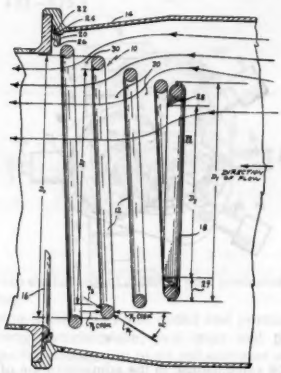
baffle being of ring-shaped configuration having a central opening therethrough and the design characteristics of said spring being governed by the following equation:

$$\pi \left(\frac{P_A}{4}\right) \Delta P + \pi \left(\frac{D_o^2 - D_i^2}{4}\right) (\Delta P \cos \alpha)\, N = F$$

wherein

$P = P_T - P_S$

P_A = pressure area



D_0 = spring mean outside diameter

D_i = spring means inside diameter

$P \cos \alpha = (P_T - P_S) \cos \alpha = P_T \cos \alpha - P_S \cos \alpha$

where α is the angle of the direction of flow with respect to center line of spring.

N = number of active spring coils

F = force generated by spring

whereby said spring expands and contracts under the influence of pressure thereby maintaining said flow through said conduit substantially constant at all times.

3,957,084

DEVICE FOR CARRYING FLEXIBLE CABLES OR PIPES FROM A FIXED CONNECTION POINT TO A MOBILE CONSUMER BY MEANS OF A FLEXIBLE TUBE

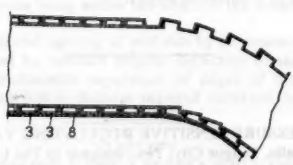
Werner Jung, Rheydt, Germany, assignor to Katrapat AG, Zug, Switzerland

Filed Feb. 11, 1974, Ser. No. 441,104

Claims priority, application Germany, Feb. 14, 1973, 7305486[U]

Int. Cl.² F16L *11/00*

U.S. Cl. 138—122 **16 Claims**



1. A device for carrying flexible cables or pipes from a fixed connection point to a mobile load, said device comprising a flexible support tube capable of bending into an arcuate curve about a bending axis spaced laterally from the tube, said flexible support tube being formed from a profiled strip having two oppositely facing, side-by-side channels formed therein, each channel having an outer sidewall, and both channels having a common inner sidewall, said strip being spirally wound on itself with the outer sidewall of each channel extending into the oppositely facing channel of the adjoining winding; and means provided along one side of said flexible tube for maintaining said one side at a constant length; the other side of said tube being variable in length to accommodate itself to the circumference of an arc following the surface of said other side and having its center at said bending axis.

3,957,085

FLEXIBLE ARTICLES

Eric Ball, Newcastle-upon-Tyne, England, assignor to Dunlop Holdings Limited, London, England

Continuation of Ser. No. 142,998, May 13, 1971, abandoned. This application Mar. 26, 1974, Ser. No. 454,828

Claims priority, application United Kingdom, May 21, 1970, 24694/70

Int. Cl.² F16L *11/08*

U.S. Cl. 138—129 **12 Claims**

1. A flexible hose comprising a reinforcing body including rubber polymeric material and having a thin protective abrasion resistant open structured non-woven surface layer of substantially randomly arranged thermoplstic filaments impregnated with a rubber polymeric material on the body, reinforcement of the hose being provided substantially only by the reinforcing body.

3,957,086

CORROSION RESISTANT TUBING

Stanley F. Gondek, Troy, Mich., assignor to Bundy Corporation, Detroit, Mich.

Division of Ser. No. 374,883, June 29, 1973, Pat. No. 3,875,027. This application Oct. 31, 1974, Ser. No. 519,425

Int. Cl.² B32B *15/00*

U.S. Cl. 138—145 **9 Claims**

1. A corrosion resistant metallic tubing comprising a steel strip formed into tubular shape and having inner and outer surfaces, a primary protective coating on said outer surface comprising one or more electrodeposited layers selected from the metals copper and nickel, there being no appreciable diffusion of said primary coating into the outer steel surface of said tubular steel strip, said primary coating having an undiffused thickness of between 0.0003 and 0.0019 inches, and a terne metal coating overlying said primary coating.

3,957,087

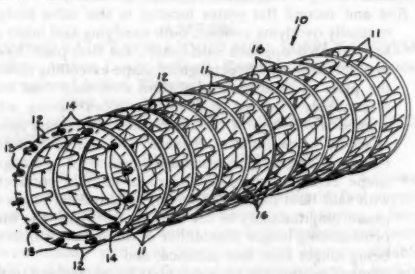
PIN AND TRUSS CYLINDER CONSTRUCTION

Henry M. Johnston, Rte. 1, Enfield, Maine 04433

Filed July 3, 1974, Ser. No. 485,709

Int. Cl.² F16L *9/00*

U.S. Cl. 138—178 **7 Claims**



1. A pin and truss cylinder construction comprising a plurality of support rings, said support rings including regularly spaced pin rod openings therethrough and regularly spaced helical truss rod openings therethrough, a plurality of spacers, said spacers between at least two support rings, a plurality of

pin rods, each said pin rod adapted to pass through at least some of said spacers and through said support rings and said pin rod openings, said pin rods threaded at each end and having nuts on said threads to tension said pin rods against said rings and spacers therebetween, said support rings and spacers and tensioned pin rods forming a cylindrical configuration, and a plurality of helical truss rods, each said helical truss rod adapted to pass through at least some of said support rings' helical truss rod openings, means to fasten said helical truss rods to the cylindrical configuration formed by said support rings and spacers and pin rods.

3,957,088

METHOD AND LOOM FOR WEAVING A FABRIC

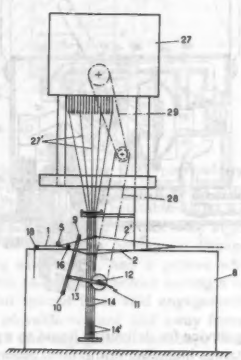
Jakob Müller, and Erich Essig, both of Aargau, Switzerland, assignor to said Jakob Müller, Aargau, Switzerland, by said Erich Essig

Continuation-in-part of Ser. No. 170,793, Aug. 11, 1971, abandoned. This application July 23, 1973, Ser. No. 381,492

Claims priority, application Germany, Aug. 12, 1970, 2040050

Int. Cl. D03d *47/00*

U.S. Cl. 139—117 **11 Claims**



1. In a method of weaving a fabric on a needle loom using a main weft thread being inserted from either side of the warp and an effect weft thread being inserted from one side of the warp, the steps of forming a shed intermediate the width of the warp and spaced from the edges thereof; moving an effect weft thread from one side into the open shed so as to form a loop laterally adjacent the opposite side of the open shed above the remaining edge warp; moving a retaining member transversely and longitudinally of said warp from said opposite side and at a location which is spaced lengthwise of the warp from said loop until it enters said loop to retain the same from being pulled out from said shed; closing said shed; and withdrawing said retaining member from said loop.

3,957,089

LOOM OF THE SHUTTLELESS TYPE

Giovanna Martinelli, Via Tonale, 14, Leffe. (Bergamo), Italy

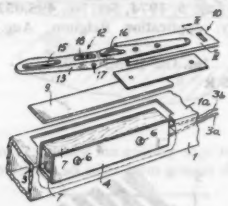
Filed Sept. 16, 1974, Ser. No. 506,628

Claims priority, application Italy, Sept. 24, 1973, 29273/73

Int. Cl.² D03D *47/18, 47/20*

U.S. Cl. 139—448 **3 Claims**

1. In a shuttleless loom of the type having a slay of which at least a portion has a hollow box-like shape with at least one substantially plane wall surface and a pair of gripper heads reciprocating in opposite directions symmetrically with respect to a point of interengagement thereof, the reciprocating movement occurring along a path extending through a shed formed by warp threads and substantially parallel to said plane wall surface, flexible propelling bands for said gripper heads having their free extremities connected to said gripper heads for imparting reciprocating motion thereto, the improvement comprising a pair of magnetic guiding devices for each gripper head near said point of interengagement thereof, each comprising within said hollow box-like shaped portion of the slay, an elongated ferromagnetic core having longitudinally extending opposite lateral sides, a pair of spaced plate members connected to said opposite lateral sides of said core and extending perpendicular to said at least one plane wall surface and parallel to said path, said pair of spaced plates extending



parallel to the beyond at least one portion of said lateral sides of said core, thereby to form a free annular space therebetween, a coil wound longitudinally around said core substantially within said free annular space, a pair of non magnetic covering plate members connected to and arranged between longitudinal edge portions of said spaced plate members and extending perpendicular to said pair of spaced plate members and covering a longitudinal extension of said annular space, thereby to provide a magnetic field guiding said gripper heads along said path near said point of interengagement when an electric current is caused to pass through said coil.

3,957,090

HYGROSCOPIC TRANSPORTING WEB

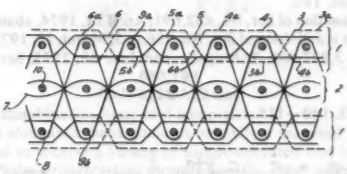
Peter Mühlen, Ulm, and Karl Kassel, Arnegg, both of Germany, assignors to Mühlen Sohn, Blaustein u. Ulm, Germany

Filed Sept. 4, 1973, Ser. No. 393,792

Claims priority, application Germany, Sept. 5, 1972, 2243478

Int. Cl.² D03D *11/00*

U.S. Cl. 139—409 **1 Claim**



1. Hygroscopic transporting web for transporting moist materials, comprising at least one inner layer consisting of a high strength, stretch resistant woven fabric including inner warp threads and inner weft threads; at least one outer layer located on one side of said inner layer and including outer warp threads and outer weft threads, at least said outer warp threads containing a highly hygroscopic fibrous material, each outer warp thread having upper ward thread portions passing over at least two outer weft threads, and lower warp thread portions passing under at least two other outer weft threads, said upper and lower warp thread portions of each outer warp thread being longitudinally staggered relative to the upper and lower warp thread portions of other outer warp threads, respectively, and each upper warp thread portion passing over outer weft threads under which a lower warp thread portion

of an other outer warp thread passes so that said lower warp thread portions do not form straight grooves across said outer layer; and tying warp threads interwoven between said outer and inner weft threads so as to tie said inner and outer layers together.

3,957,091

REINFORCING FABRICS

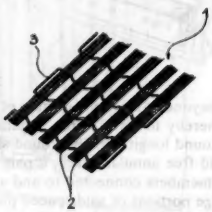
Noel Buyssens, Bossuit; Jan Davidts, Rollegem, and Arseen Nottebaere, Aalbeke, all of Belgium, assignors to N.V. Bekaert S.A., Zwevegem, Belgium

Filed Aug. 5, 1974, Ser. No. 495,052

Claims priority, application Belgium, Aug. 29, 1973, 804133

Int. Cl.² D03D *15/02*

U.S. Cl. 139—425 R 4 Claims



1. In a plain woven fabric for reinforcing a resilient material, the improvement in accordance with which the warp of the fabric consists of unstranded steel wires held together side by side in groups of individually straight wires by the weft of the fabric, said weft maintaining said groups in the general planes of the fabric and in spaced relationship to each other to thereby form an open weave.

3,957,092

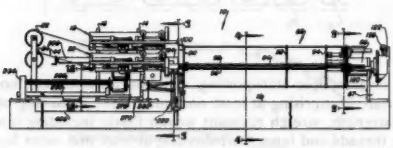
APPARATUS FOR FORMING TWISTED PAIRS OF CONDUCTOR WIRE

Fred W. Loy, Whitehall; William J. Harms, Nunica; Charles W. Wojahn, Holland, and Frederick Karasinski, Grand Rapids, all of Mich., assignors to Gardner-Denver Company, Dallas, Tex.

Continuation of Ser. No. 462,691, April 22, 1974, abandoned, which is a division of Ser. No. 236,413, March 20, 1972, Pat. No. 3,827,465. This application June 30, 1975, Ser. No. 591,580

Int. Cl.² B21F *7/00*

U.S. Cl. 140—115 3 Claims



1. A method for forming a twisted pair of electrical conductor wires comprising the steps of:

providing a wire twisting apparatus including means for supporting a pair of wires in substantially side-by-side relationship and including a wire tensioning device through which said pair of wires may be longitudinally pulled;

cutting a first wire to a predetermined length;

cutting a second wire to a predetermined length;

placing said first and second wires side by side on said apparatus so that an end portion of said first wire is adjacent and end portion of said second wire;

inserting a portion of said wires in said tensioning device;

gripping the adjacent end portions of said first and second wires;

rotating said wires to twist said wires together and pulling said wires longitudinally through said tensioning device while twisting said wires together; and,

applying a frictional drag force to said wires while said wires are being pulled longitudinally through said tensioning device and while said wires are being twisted together.

3,957,093

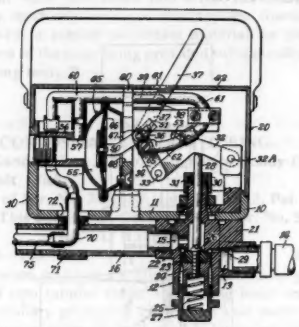
LIQUID SUPPLY DEVICE WITH AUTOMATIC FLOW CUT-OFF

Joel A. Stoner, 700 N. O'Plaine Road, Gurnee, Ill. 60031

Filed Feb. 13, 1975, Ser. No. 549,686

Int. Cl.² B65B *3/26*

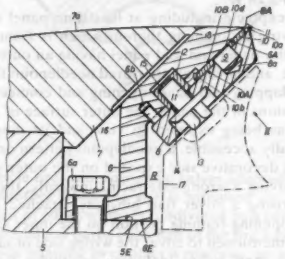
U.S. Cl. 141—209 2 Claims



1. In a filling device for delivering liquid to a predetermined level in a container including liquid level automatic flow cut-off means comprising a normally closed liquid supply valve having inlet and oulet ports, said inlet port having a restricted diameter which allows liquid to flow into said valve at a substantially reduced rate of flow from a liquid supply line, resilient means urging the valve into seating engagement with a valve seat, a liquid delivery nozzle in fluid-flow communication with said outlet port of said liquid supply valve, manually operable means for opening said valve, latch means for securing said valve in open position, a diaphragm operatively connected to said latch means for releasing the valve to cut off liquid flow to said delivery nozzle, a casing for said diaphragm open to the atmosphere at one side and having a normally closed diaphragm chamber at the other side of the diaphragm, an air tube axially disposed within the lower end portion of said delivery nozzle in liquid flow clearance with said nozzle, tubular means providing an air passage connecting said normally closed diaphragm chamber with said air tube, said delivery nozzle having at the lower end thereof a cylindrical filling tip which extends axially beyond the end of said air tube with said air tube having the lower end thereof disposed axially within said filling tip and being flared outwardly to form liquid flow passages of reduced clearance within said filling tip to effect entraining air from within said air tube, additional liquid flow passages of increased size being provided within said filling tip by a plurality of spaced flats on the peripheral surface of the outwardly flared lower end of said air tube, and the amount of clearance between the outwardly flared lower end of said air tube and said filling tip being coordinated with the size of said inlet port of restricted diameter whereby liquid flowing through said liquid flow passages actuates said latch means only when the lower end of the liquid delivery nozzle

is closed by liquid within said container rising to said predetermined level.

3,957,094
ROTARY MATERIAL REMOVING TOOL WITH EXPENDABLE BLADES
Gerhard Maier, Brackwede, Germany, assignor to Maschinenfabrik G. Maier KG, Brackwede, Germany
Filed July 19, 1974, Ser. No. 490,216
Claims priority, application Germany, July 23, 1974, 2337405
Int. Cl.² B27G *13/04*; B26D *1/36*
U.S. Cl. 144—230 **10 Claims**



1. In a material-removing tool, particularly in a tool for removing shavings and chips from wood, a combination comprising a main body portion rotatable about a predetermined axis and having a peripheral surface with at least one recess therein, said body portion having an engagement surface partly flanking said recess, and a groove which extends in parallelism with said axis; a holder having a contact surface adjacent to but spaced from said engagement surface, said holder being movable toward and away from as well as in parallelism with said engagement surface; a flat blade disposed between said engagement and contact surfaces; means for normally biasing said holder toward said engagement surface so that said blade abuts against said engagement and contact surfaces; first locating means for holding said blade against movement in parallelism with said contact surface while said blade abuts against said engagement and contact surfaces, said blade being separable from said first locating means by moving substantially at right angles to said contact surface; and second locating means for normally blocking the movement of said holder toward and away from said peripheral surface, at least while said blade abuts against said engagement and contact surfaces, said second locating means including a guide member received in said groove of said body portion, and means for separably securing said guide member to said holder.

3,957,095
ROUGH HEWN BENCH PLANE ATTACHMENT
Glen E. Johnson, Baldwin Hill Road, Brookfield, Conn. 06804
Filed Nov. 6, 1974, Ser. No. 521,517
Int. Cl.² B27G *17/02*
U.S. Cl. 145—5 R **13 Claims**

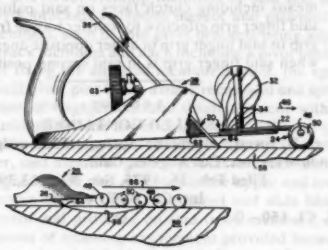
1. An improved bench plane having a lower surface and a forward end, wherein the improvement comprises:

A. a chassis mounted to the forward end of said bench plane;

B. means for 360° rotational eccentric rolling rotatably connected to the chassis; and

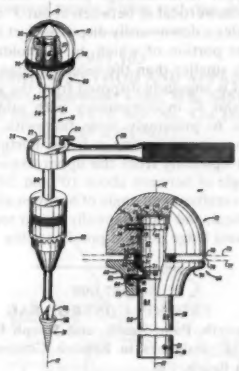
C. a cutting iron adjustably positioned within said bench plane having a cutting edge projectable beneath the lower surface of said bench plane;

whereby forward movement of the bench plane causes the eccentric rolling means to continuously rotate in an eccentric



manner thereby causing the cutting edge to remove material from the workpiece so as to form gouges therein.

3,957,096
COMBINATION HAND TOOL
Victor W. Rodman, 8886 Phoenix Ave., Fair Oaks, Calif. 95628
Filed Apr. 28, 1975, Ser. No. 572,137
Int. Cl.² B25B *15/04*
U.S. Cl. 145—50 R **6 Claims**



1. A combination hand tool comprising:

a. an elongated shank having a ball detent mounted on one end to receive a variety of torque-operated tool heads;

b. a palm grip rotatably mounted on the other end of said shank;

c. a finger grip mounted on said shank intermediate said ends for limited translational movement along said shank between a first position spaced from said palm grip and a second position in engagement with said palm grip, the distance between said palm grip and said finger grip in said first position of said finger grip enabling the user to engage said finger grip with the thumb and fingers of one hand while engaging said palm grip with the palm of the same hand;

d. means connecting said finger grip and said shank for transmitting torque from said finger grip to said shank;

e. spring means mounted on said tool for biasing said finger grip toward said first position with a predetermined force, the user's said thumb and fingers being effective to engage said finger grip, when the palm of said hand is located on said palm grip, and to urge said finger grip from

said first position toward said second position in opposition to said predetermined force; and,

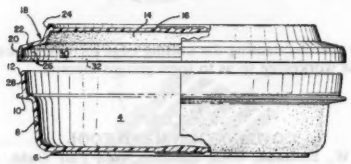
f. clutch means for engaging said palm grip and said finger grip in said second position of said finger grip, said clutch means including clutch faces on said palm grip and on said finger grip effective to transfer torque from said palm grip to said finger grip in either opposite angular direction when said finger grip is in said second position.

3,957,097

SEALED CONTAINER

James B. Swett, Altamonte Springs, Fla., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Feb. 26, 1975, Ser. No. 553,398
Int. Cl.² B65D 43/08
U.S. Cl. 150—0.5 8 Claims



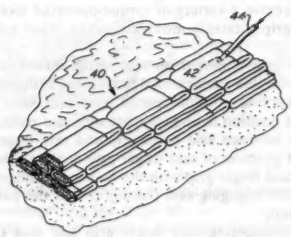
1. A storage vessel comprising in combination a hermetically interengaged container and container closure of like polymeric materials wherein said container includes a sidewall having an upper terminal edge portion that protrudes outwardly from the vertical at between about 3° and 8°; and said closure includes a downwardly disposed skirt having an inside surface a first portion of which, in its molded condition, is dimensionally smaller than the terminal edge portion of said container and is angularly disposed from the vertical at about between 3° and 8° in congruency with said terminal edge portion so as to pressingly mate therewith, said container closure further incorporating a ledge portion that extends inwardly and upwardly from the upper extremity of said lip first at an angle of between about 10° and 20° from the horizontal and thereafter at an angle of between about 10° and 20° from the vertical, and a substantially planar top wall integrally attached to said ledge portion proximate the inner extremity thereof.

3,957,098

EROSION CONTROL BAG

George Hepworth, Palm Beach, and Joseph F. Kelly, Miami, both of Fla., assignors to Erosion Control Incorporated, West Palm Beach, Fla.

Filed June 26, 1972, Ser. No. 266,177
Int. Cl. B65d 33/16
U.S. Cl. 150—9 10 Claims



1. An erosion control bag comprising a bag of dark-colored fabric having a length substantially greater than its width, and closed at both ends, said fabric having a porosity of 10 to 35 cubic feet per minute, means defining a nozzle opening spaced from the ends of the bag and through which a nozzle may extend to introduce water and a filler, said nozzle opening being closer to one end of the bag than the other, said means including two overlapping layers of fabric stitched together by spaced sets of stitching leaving an unstitched portion which defines the nozzle opening in the central portion spaced from the side edges of the bag.

3,957,099

ART OF MANUFACTURING NEEDLEPOINTED ACCESSORIES

Ervin Kery, 509 Mulberry Drive, West Bend, Wis. 53095

Filed May 22, 1975, Ser. No. 580,124
Int. Cl.² A45C 3/08
U.S. Cl. 150—28 R 8 Claims

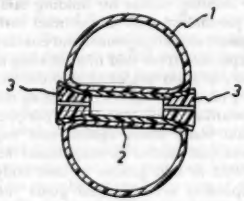
1. In a receptacle including at least one panel of flexible material having an opening therein which is framed by the material of the panel and said panel having an outer side and an inner side, and having an apertured needlepoint foundation canvas overlapping said panel opening and connected to the framing portions of the panel, the outer surface of said foundation canvas being exposed to view and its inner surface being manually accessible, a needlepoint pattern on said canvas having a decorative side exposed on the outer side of the panel and having a wrong side facing inwardly, the improvement comprising a cover flap hingedly attached along one edge to an opening-framing portion on the inner side of said panel and dimensioned to cover the wrong side of said needlepoint pattern, and means including releasable fasteners on said receptacle for releasably holding said cover flap in a position covering the wrong side of said needlepoint pattern.

3,957,100

PNEUMATIC WHEEL FOR TRAVEL ON ALL TYPES OF TERRAIN

Jean Guidetti, 8 Avenue de Gairaut, Nice 06100, France

Filed Feb. 6, 1975, Ser. No. 547,877
Int. Cl.² B60B 9/00; B60C 5/00
U.S. Cl. 152—9 12 Claims



1. A pneumatic wheel comprising an inflatable element of substantially toroidal shape having a central tubular passage, a hub disposed in said central passage, and means frictionally coupling said hub and inflatable element without physically securing the same together so that no physical connection exists between said hub and the inflatable element thereby permitting the latter to freely deform in the vicinity of the hub and become locally spaced therefrom, said hub comprising a tube slidably engaged in said central passage of the inflatable element, said tube having extremities, said coupling means comprising conical closure plugs engaged in said extremities of the tube to dilate said extremities sufficiently to prevent the tube from separating from the central passage.

3,957,101
PUNCTUREPROOF TIRE

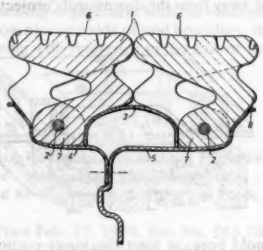
Jakob Ippen, Leverkusen, and Friedel Stüttgen, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 31, 1975, Ser. No. 563,477

Claims priority, application Germany, Apr. 3, 1974, 2416204

Int. Cl.² B60C *7/08, 17/04*

U.S. Cl. 152—301 **9 Claims**



1. A vehicle tire comprising two halves adapted to lie alongside one another when the tire is mounted on a wheel rim having a pair of edges which is subdivided by a central annular ring into two lateral parts, each half of the tire having an outer tread surface adapted to contact a roadway, an inner surface adapted to contact one half of the subdivided wheel rim, a resilient connecting part being segmentally divided and diagonally constructed and arranged in a uniformly and oppositely arranged hollow configuration having continuous air channels, and successive segments of the resultant diagonal hollow configuration being alternately directed to and supported by an edge of the wheel rim and the central annular ring of the subdivided rim whereby the continuous air channels in the diagonal segmental arrangement of the connecting part substantially reduces the weight of the tire and insure adequate cooling when the tire is in motion.

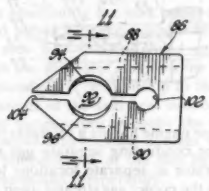
3,957,102
BI-FOLD DOOR ASSEMBLY

John J. Kempel, West Branch, Mich., assignor to Garland Manufacturing Company, Detroit, Mich.

Filed Feb. 24, 1975, Ser. No. 552,660

Int. Cl.² E05D *15/26*

U.S. Cl. 160—206 **7 Claims**



1. A bi-fold door assembly for use in a doorway opening framed by a header, a sill and side wall jambs, said assembly including upper and lower track members mounted respectively on the header and sill and extending between the side wall jambs, a pair of bi-fold door panels hinged together at next adjacent side edges and of a size to extend between said track members and to close at least part of said doorway opening, means for fixed pivotal location provided between said track members and one of said door panels at the outer disposed upper and lower corners thereof, and means for guided pivotal retension provided between said track members and the other of said door panels at the opposite outer disposed upper and lower corners thereof, said means of fixed pivotal location including axially aligned pivot pins mounted in the upper and lower framing members of said one door panel and pivot brackets receptive thereof and provided on said track members, each of said pivot brackets being adjustable on said track members and each including a pivot bushing and means of fixing the adjusted location thereof, the upper disposed of said pivot pins being axially reciprocal and spring biased for ease of engagement and disengagement with its respective bushing, and the lower disposed of said pivot pins including means for setting the door height relative to said sill track member, said means of guided pivotal retention including axially aligned guide pins mounted in the upper and lower framing members of said other door panel and slide blocks receptive thereof and provided on said track members, and snap-fitted means of retaining engagement provided between said guide pins and said slide blocks (including); said snap-fitted means including having slide blocks (being) formed for track engagement at relatively opposite side edges thereof, an opening provided clear through said slide blocks between opposite faces thereof and receptive of a guide pin therewithin, said guide pins having a tapered headed end formed to be axially received through said slide block openings and including a ring groove provided next adjacent thereto, and means provided within said slide block openings and between the open ends thereof for fitted engagement with said groove and retention of said guide pins to said slide blocks, said openings being relieved at one end of said slide blocks for providing yielding resistance in the extension of the headed end of said guide pins therethrough and snap-fitted engagement of said retention means within said ring grooves.

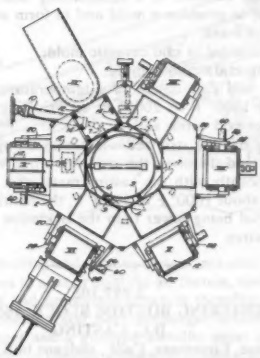
3,957,103
MOLD MAKING METHOD AND APPARATUS

Harrison E. Fellows, Clearwater Lake, Wis. 54518

Filed Nov. 15, 1974, Ser. No. 524,164

Int. Cl.² B22C *9/12*

U.S. Cl. 164—16 **5 Claims**



1. A method of making a sand mold which comprises the steps of providing a form box assembly having wall means defining in part a cavity with open faces for insertion of pattern plates and said wall means including interior and exterior wall portions spaced to provide a gas passage therebetween, apertures in said interior wall portions to afford fluid communication between said cavity and said passage, said wall means further defining a gas inlet to said cavity and a gas outlet in communication with said passage, and closure means to open

and close said faces, moving the form box to a sand filling station, filling the form box with sand having a gas activated binder, rotating the form box to a gas innoculation station, injecting gas into the sand to activate the binder and cause hardening of the sand, rotating the form box to a pattern removal station, and moving the form box to a pouring station.

3,957,104

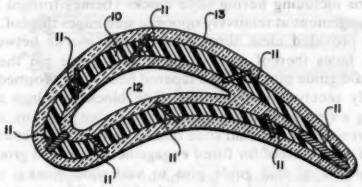
METHOD OF MAKING AN APERTURED CASTING

Andrew Terpay, Middleburg Heights, Ohio, assignor to The United States of America as represented by the Administrator of the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 27, 1974, Ser. No. 446,568

Int. Cl.² B22D *29/00*

U.S. Cl. 164—132 **12 Claims**



1. A method of making a cast object of the type having perforations or passages therein comprising the steps of:

forming a duplicate of the object to be cast from a material having a relatively low melting point;

inserting wires in said object duplicate corresponding to the desired location of apertures in said object, said wires being selected from a metal which oxidizes when subjected to a temperature from about 1000° to 2000°;

forming a ceramic coating on said duplicate object;

removing said material;

firing said ceramic in a substantially nonoxidizing atmosphere to produce a mold and to form an oxide coating on said wires;

casting a metal in said ceramic mold;

removing said ceramic mold;

heating said cast object to a temperature range of from about 1000° F to 2000° in an oxidizing atmosphere to oxidize said wires; and

leaching out the oxidized wires with an agent which corrodes and dissolves the oxidized wires without reacting significantly with the casting metal at a temperature of from about 1000° F to 1500° F, the melting point of said material being lower than the oxidation temperature of said wires.

3,957,105

SELF-CENTERING BOTTOM BLOCK ASSEMBLY FOR D.C. CASTING

John J. Foye, Livermore, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 262,509, June 14, 1972, Pat. No. 3,847,206. This application Aug. 22, 1974, Ser. No. 499,729

The portion of the term of this patent subsequent to Nov. 12, 1991, has been disclaimed.

Int. Cl.² B22D *11/08*

U.S. Cl. 164—274 **8 Claims**

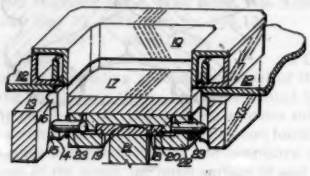
1. In a vertical D.C. casting apparatus for light metal comprising an open-ended D.C. mold and a bottom block adapted to be inserted into the mold prior to casting, the improvement comprising:

a. a bottom block adapted to be inserted into the mold and having sufficient dimensions to seal the discharge end of the mold;

b. a vertically moving bottom block support member, the upper surfaces of which are adapted for slidable contact with the bottom surfaces of the bottom block;

c. retaining means to loosely lock the bottom block to the support member and thereby allow for slidable horizontal movement of the bottom block with respect to the support member;

d. at least two recessed guide surfaces disposed below the mold and away from the downwardly projected periphery



of the mold bore, at least the lower portion of the recessed guide surfaces converging toward the discharge end of the mold;

e. guide extensions in association with the bottom block which are adapted to be inserted into the recess defined by the guide surfaces as the bottom block is raised, to thereby align the bottom block with respect to the mold bore and prevent any contact between the bottom block and mold; and

f. means to restrict the movement and the rotation of the bottom block in a horizontal plane to ensure insertion of the guide extensions into the recess defined by the guide surfaces.

3,957,106

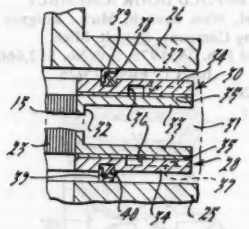
SEAL FOR GAS TURBINE REGENERATOR

James Harold Whitfield, Royal Oak, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 15, 1974, Ser. No. 514,522

Int. Cl.² F23L *15/02*; F02C *7/10*

U.S. Cl. 165—9 **18 Claims**



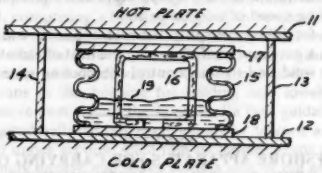
1. In a gas turbine engine having a rotatable regenerator and conduit means for conducting separate gas streams to and from said regenerator at separate locations to transfer heat from the hotter to the cooler gas streams upon rotation of said regenerator, the combustion of sealing means for accommodating relative distortion of said regenerator and conduit means resulting from different and changing physical conditions of said gas streams and defining a boundary for at least one of said streams, said sealing means comprising a rubbing seal and a static seal, said rubbing seal having a portion in sliding fluid sealing engagement with said regenerator at said boundary, said static seal comprising a channel of substantially L-shaped cross section opening toward the high pressure side of said boundary and defined by a pair of channel sides maintained by the fluid pressure differential across said boundary in sliding fluid sealing engagement respectively with

portions of said rubbing seal and conduit means at said boundary, said channel sides being dimensioned and arranged between the two members comprising said rubbing seal and conduit means to provide sufficient axial and radial lost motion freely with respect thereto to avoid compression therebetween in consequence of said relative distortion, said portions of said members in said sliding engagement with said channel sides comprising a) an axially extending portion of one of said members in sliding fluid sealing engagement with one of said channel sides at the low pressure side of said boundary and b) a radially extending portion of the other of said members in sliding fluid sealing engagement with the other of said channel sides at the low pressure side of said boundary, the terms axial and radial being with reference to the axis of rotation of said regenerator.

3,957,107
THERMAL SWITCH

Frank E. Altoz, Baltimore, and Richard F. Porter, Millersville, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 27, 1975, Ser. No. 553,700
Int. Cl.² F28D *15/00*; **G05D** *23/00*
U.S. Cl. 165—32 **2 Claims**



1. A thermal switch for providing a flow of heat from a heat source to a heat sink at a predetermined temperature of the heat sink comprising:

a. an expansible bellows having a fixed end plate and a movable end plate the said bellows and end plates defining a sealed expansible chamber;

b. an expansible wick positioned within the said bellows in thermal contact with the said end plates and communicating therebetween;

c. a refrigerant positioned within the said expansible chamber; and

d. means for positioning the said bellows with the said attached end plates between the said heat source and the said heat sink with the said fixed end plate thermally attached to the said heat sink and the said movable end plate in spaced apart relationship to the said heat source at temperatures of the said heat sink below the said predetermined temperature whereby the said movable end plate will move into thermal contact with the said heat source at temperatures of the said heat sink above the said predetermined temperature.

3,957,108
MULTIPLE-COMPLETION GEOTHERMAL ENERGY PRODUCTION SYSTEMS

Allen T. Van Huisen, 29456 Indian Valley Road, Rolling Hills Estates, Calif. 90274

Division of Ser. No. 375,751, July 2, 1973. This application Oct. 3, 1974, Ser. No. 511,810
Int. Cl.² F03G *7/02*
U.S. Cl. 165—45 **6 Claims**

1. A method of recovering geothermal energy comprising the steps of:

drilling a well from the surface into a geothermal zone;

lining the borehole of the well with a metal casing;

perforating the casing at a level within the upper portion of said zone and remote from the lower end of the casing;

plugging the casing just below the perforation to form a first plug;

squeezing cement through the perforation to form an annular cement ring exterior of the casing;

cementing the outside of the casing from the surface to the annular ring to form an uncased lower barefoot extension of the metal casing;

drilling out said plug;

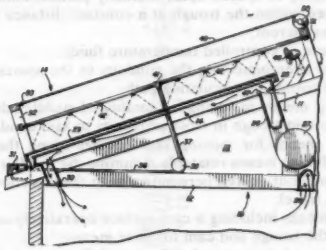
installing a plug at the lower end of the case to form a heat exchanger; and

installing a central heat exchange fluid injection pipe within said casing.

3,957,109
SOLAR COLLECTOR — HEAT EXCHANGER

Mark N. Worthington, 10227 White Mountain Road, Sun City, Ariz. 85351

Filed Oct. 31, 1974, Ser. No. 519,521
Int. Cl.² F25B *29/00*
U.S. Cl. 165—48 **12 Claims**



1. In a solar heating and cooling system intended for installation in premises to heat or cool the air therein, said premises including a roof and supporting structure therefore,

a. a solar collector and heat exchanger including a flat metallic sheet and a grooved metallic sheet secured to said flat sheet to provide a plurality of longitudinal channels which have a vertical component when said exchanger is mounted on said roof;

b. an upper manifold communicating with said channels at the upper ends thereof;

c. a duct depending from said upper manifold and extending into said premises;

d. an air blower within said premises connected to said upper manifold;

e. a lower manifold communicating with said channels at the lower ends thereof;

f. a duct depending from said lower manifold and having a discharge end in said premises;

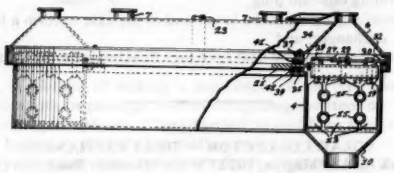
g. a heat trap in the form of a flat transparent sheet removably mounted on said heat exchanger;
h. an arrangement of spray pipes mounted above said heat exchanger in spaced relation and substantially parallel thereto;
i. a source of water;
j. means for introducing water under pressure from said source into said spray pipes, and,
k. a retractable sunshade mounted on said roof over said arrangement of spray pipes in a position substantially parallel to said exchanger;

whereby said sunshade may be retracted into a position exposing the upper surface of the grooved sheet of the heat exchanger to rays of the sun and the heat trap positioned over said heat exchanger for heating purposes or the heat trap removed from position covering said heat exchanger and the sunshade extended into position protecting said arrangement of spray pipes and exchanger for cooling purposes.

3,957,110
CONTINUOUS PROCESS DRYER

Arnaldo Rubini Vargas, Ricardo Palma 869 (Dpto. 402), Lima 18, Peru

Filed Jan. 16, 1975, Ser. No. 541,441
Int. Cl.² F28G *3/10*
U.S. Cl. 165—94 **8 Claims**



1. A heat transfer system for particulant material comprising:

A trough for placement of the material;
a plurality of spaced apart mutually parallel conduits disposed within the trough at a constant distance from the sides thereof,
a source of controlled temperature fluid;
means interconnecting the conduits to the source of fluid and forming a circulating path;
mixing means including a plurality of paddles depending into said trough in close proximity to said conduits;
drive means for moving said paddles along the trough, including means rotatably mounting the paddles for rotation about an axis perpendicular to the direction of paddle travel;
cam means including a cam surface operatively connected to the trough and cam follower means;
tie means interconnecting the cam follower and the means rotatably mounting the paddles.

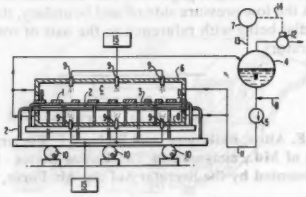
3,957,111
APPARATUS FOR COOLING SOLIDS OF HIGH TEMPERATURE

Toshiji Kobayashi, and Yutaka Takahashi, both of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Nov. 30, 1973, Ser. No. 420,500
Claims priority, application Japan, Nov. 30, 1972, 47-120487
Int. Cl.² F28F *27/00*; C21B *7/10*; C21D *1/74*
U.S. Cl. 165—96 **6 Claims**

1. An apparatus for cooling a high temperature solid, comprising:

wall means enclosing a high temperature solid in spaced relationship thereto to be heated substantially by radiation of the heat from said solid, said wall means including means for circulating a liquid coolant therethrough, a coolant inlet and a coolant outlet;
pump means for feeding said liquid coolant into said circulating means through said inlet;
separator means for separating said coolant into liquid and gaseous phases;
first conduit means connecting said coolant outlet of said circulating means to said separator means;
second conduit means connecting said separator means to said pump means;

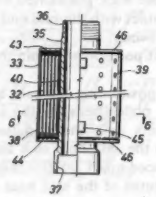


pressure control means connected to said separator means for varying the gas pressure therein to change the saturation temperature in said separator means to thereby control the liquid coolant temperature and consequently the cooling speed of said solid; and
means for filling the space between the solid and the wall with a gas capable of absorbing the heat of radiation from said solid and to thus control the cooling speed of said solid.

3,957,112
OFFSHORE APPARATUS FOR CARRYING OUT OPERATIONS IN AN OFFSHORE WELL

David E. Knibbe, Delft, Netherlands, and David C. S. Pitham, Pakuranga, Auckland, New Zealand, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 14, 1974, Ser. No. 523,640
Claims priority, application United Kingdom, Nov. 20, 1973, 53724/73
Int. Cl.² E21C *19/00*
U.S. Cl. 166—.5 **15 Claims**



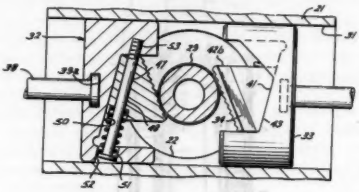
1. Offshore apparatus for carrying out operations in a submerged well, said apparatus comprising underwater well equipment, a floating platform and a marine riser, said riser extending upwards from the well equipment in the direction of the platform and consisting of sections interconnected by coupling means, buoyancy-transmitting means secured to the outer surface of a plurality of said riser sections between and displaced from said coupling means thereof, each riser section provided with buoyancy-transmitting means comprising a large-diameter open-ended tube and small-diameter stiff-walled fluid-tight buoyancy tubes of circular cross-section arranged around the outer wall of the large-diameter tube and against the buoyancy-transmitting means in a manner such that the outer wall parts of the buoyancy tubes are exposed to and loaded by a pressure substantially equal to the hydrostatic

pressure at the level of these parts, and the buoyancy force of the buoyancy tubes is transmitted to the large-diameter tube through said buoyancy-transmitting means.

3,957,113
PIPE DISCONNECTING APPARATUS

Marvin R. Jones, and Paul E. Helfer, both of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed May 6, 1974, Ser. No. 467,158
Int. Cl.² E21B *33/03*; B25B *17/00*
U.S. Cl. 166—77.5 **8 Claims**



1. Apparatus for disconnecting the lower threaded end of an upper section from the upper threaded end of a lower section of a pipe string extending through the bore of an underwater wellhead, comprising a housing adapted to be connected as a part of the wellhead, said housing having a bore therethrough alignable with the bore of the wellhead to receive the ends of said sections, and guideways extending outwardly from the bore, means in the housing for holding said lower section against movement within the bore, and a ram guidably movable longitudinally within each guideway toward and away from said upper section, each ram including means arranged to grippingly engage and move along a side of the end of the upper section, and thereby exert a force on said upper section tending to rotate it about its axis, as the ram is moved in one direction, and to be relieved from said gripping engagement, as the ram is moved in the opposite direction, whereby said ram may be returned to a position from which it may again be moved in said one direction for exerting force on said upper section, said housing having additional guideways extending outwardly from the bore thereof below the first-mentioned guideways, said holding means including additional rams each mounted in an additional guideway for movement toward and away from the bore and having a recess therein to fit tightly about a portion of said lower section, and said additional rams including means for sealing about said lower section, with one another, and with the additional guideways to close off the bore through the housing about said lower section.

3,957,114
WELL TREATING METHOD USING AN INDEXING AUTOMATIC FILL-UP FLOAT VALVE

Steven G. Streich, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed July 18, 1975, Ser. No. 597,376
Int. Cl.² E21B *33/14*, *33/16*
U.S. Cl. 166—285 **7 Claims**

1. A method of alternately permitting and preventing fluid flow in a reverse direction while continuously permitting fluid flow in a forward direction through a conduit having a check valve disposed therein initially normally closing the conduit to reverse fluid flow therethrough, comprising the steps of:

a. flowing fluid through the conduit and check valve in the forward direction at a flow rate exceeding a predetermined value;

b. moving the check valve to a position opening the conduit to fluid flow in the forward direction in response to fluid flow in the forward direction at a flow rate exceeding the predetermined value;

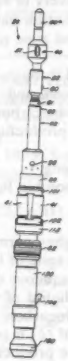
c. reducing the flow rate of fluid through the conduit and check valve in the forward direction to a flow rate less than the predetermined value; and

d. retaining the check valve in a position opening the conduit to fluid flow therethrough in the forward direction and, alternately, in the reverse direction.

3,957,115
METHOD AND APPARATUS FOR TREATING WELLS

Richard Kerzee, Longview; Robert W. McCollum, Allen, and Carter R. Young, Lewisville, all of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 15, 1974, Ser. No. 460,773
Int. Cl.² E21B *29/00*, *23/00*
U.S. Cl. 166—297 **6 Claims**



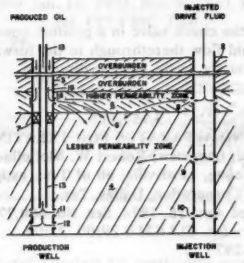
1. A method of treating an earth formation through a well bore comprising: setting a wireline operated retrievable plug in a landing nipple in said well bore for temporarily blocking said well bore against downward flow at a first depth; perforating the wall of said well bore above said plug; introducing treating fluid into said well bore and displacing said fluid into said earth formation above the location at which said well bore is temporarily blocked; releasing, lifting, and resetting said plug by wireline means at another landing nipple without removal from said well bore for temporarily blocking said well bore at a second lesser depth above the location of the first treating step; again perforating the wall of said well bore

above said plug; displacing treating fluid into said formation from said well bore above said second location of blocking said well bore; and thereafter sequentially engaging, releasing, lifting and resetting said plug by wireline means at subsequent landing nipples up said well bore for temporarily blocking said well bore at spaced locations up said bore, perforating the wall of said well bore above said plug, and displacing treating fluid into said formation from said well bore above each location of blocking said well bore until the desired depth of said formation has been incrementally treated; and said retrievable plug being moved is said well bore by means of a combined handling tool and perforator which first engages, lifts and resets said plug and thereafter is disengaged from said plug lifted and effects perforations through the wall of said well bore.

3,957,116
FLUID FLOW CONTROL IN WATERFLOOD

Larry S. Bouck, Tulsa, Okla., assignor to Cities Service Company, Tulsa, Okla.

Filed May 19, 1975, Ser. No. 578,450
Int. Cl.² E21B *43/22*
U.S. Cl. 166—245 **10 Claims**



1. In a process for recovery of liquid hydrocarbons from a hydrocarbon-bearing formation having a first zone of higher permeability than a second zone of lower permeability comprising:

a. injecting a drive fluid through an injection well vertically traversing the formation, and

b. recovering liquid hydrocarbons which are displaced by the drive fluid from a production well vertically traversing the formation;

the improvement comprising:

c. injecting a water insoluble liquid into the first zone of higher permeability

wherein:

d. the first zone of higher permeability is an upper zone overlying the second zone of lower permeability,

e. the drive fluid is an aqueous drive fluid,

f. the water insoluble liquid of (c) is petroleum or a petroleum-derived hydrocarbon, and

g. the insoluble liquid of (c) is injected into the upper permeable zone from the production well.

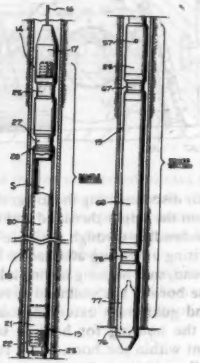
3,957,117
METHOD AND APPARATUS FOR BOTTOM HOLE TESTING IN WELLS

Clarence R. Dale, 1900 E. Ocean Blvd., Long Beach, Calif. 90802

Filed Aug. 5, 1974, Ser. No. 494,727
Int. Cl.² E21B *49/00*
U.S. Cl. 166—264 **22 Claims**

1. In a well fluid sampling employing a tool containing an initially sealed empty evacuated sample chamber separable from the tool and having top and bottom passages for fluid flow into and out of the chamber, the method that includes lowering the tool on a flexible line to pressurized sampling depth in a well while maintaining the chamber closed against well fluid entry, admitting to and sealing in said chamber a well fluid sample from the sampling depth and from a location in the well bore inwardly from the well formation, preserving in the chamber the well pressure at that depth, withdrawing the tool from the well, relieving the chamber pressure, separating the chamber from the tool, and removing the chamber contents for examination of its contents.

5. Apparatus for well fluid sampling comprising a tool adapted to be lowered on a flexible line to sampling depth in a well and comprising a first body section containing a closed empty evacuated sample chamber detachably connected to a



second power body section, said chamber having a bottom sample inlet and a top normally closed fluid vent passage, means operable independently of the well fluid pressure to admit to and entrap a well fluid sample within said chamber having the pressure and composition existing at the sample location, and means carried by said second body section operable independently of the well fluid pressure to actuate said admitting means after the tool has been lowered to sampling depth in the well, said sections being separable after the tool has been removed from the well to permit separate and independent recovery of said chamber and its contained sample having the composition and pressure existing at the sampling location.

3,957,118
CABLE SYSTEM FOR USE IN A PIPE STRING AND METHOD FOR INSTALLING AND USING THE SAME

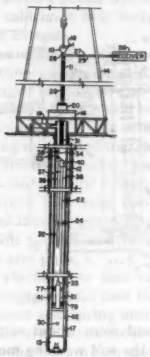
Adelbert Barry; Leon H. Robinson, and Jerry M. Speers, all of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

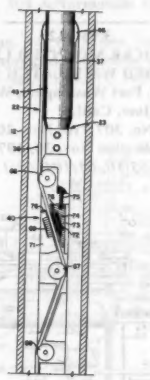
Filed Sept. 18, 1974, Ser. No. 507,020
Int. Cl.² E21B *7/00, 47/12*
U.S. Cl. 166—315 **14 Claims**

1. In a cable mounting method wherein an electric cable extends from a subsurface location within a rotary pipe string to an upper guide assembly, from said upper guide assembly downwardly to a lower guide assembly, and from said lower guide assembly upwardly to the surface, the improvement comprising anchoring said cable at said subsurface location and maintaining the cable portion between said subsurface location and said upper guide assembly in tension.

4. In a method for maintaining electrical continuity in a drill string which includes placing in said drill string a cable to form a first portion which extends from a subsurface location up to and around a guide supported on said drill string, a second portion which extends from said guide downwardly to a lower loop, and a third portion which extends from the lower loop

substantially to the surface; adding a pipe section to said drill string; and threading an upper end portion of said third portion through said pipe section, said overlapped second and third portions providing excess cable permitting upward movement of said third portion, the improvement which comprises anchoring said cable at said subsurface location and gripping said cable at said guide to maintain said first portion in tension.





6. In a cable system for wellbore telemetry which includes a cable arranged in a pipe string to extend from a subsurface location in said pipe string to an upper guide assembly, from said upper guide assembly to a lower guide assembly, from said lower guide assembly to the surface, the improvement which comprises means for maintaining the portion of cable which extends from said subsurface location to said upper guide assembly in tension.

3,957,119
PUMP DOWN METHOD

John H. Yonker, P.O. Box 34380, Dallas, Tex. 75234

Filed Dec. 18, 1974, Ser. No. 533,946
Int. Cl.² E21B *43/00*
U.S. Cl. 166—315 **7 Claims**

1. The method of performing a desired operation in one conduit of a system having a pair of conduits interconnected at a point axially spaced from the work location; said method utilizing a tool having a pair of spaced pistons one being a transport piston and the other being a bypass piston connected together by connection means and having a bypass valve means associated with the bypass piston which is open when the connecting means is placed in tension and is closed when the connecting means is placed in compression including the steps of:

pumping said tool in a first direction in said one conduit until the pistons bridge the interconnection of the pair of conduits and the bypass piston is in a position to perform the desired operation at the work location and the connecting means is in compression,

applying fluid pressure in the pair of conduits simultaneously with the pressure applied to said one conduit being at least as great as the pressure applied in the other conduit which provides a column of fluid between the spaced pistons through which force is exerted in said first direction and the desired operation is performed,

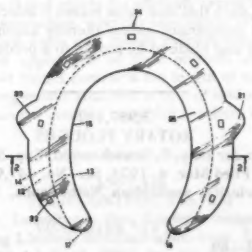
removing said tool from the work location in said one conduit by providing a pressure in said one conduit which is less than that in the other conduit to place the connecting means in tension and open said bypass valve means, and

pumping fluid into said other conduit to move said tool in a second direction.

3,957,120
HORSESHOE

Alletrux, Marcel Frederic Leopold, La Korrigane, Saint-Cyr-l'Ecole, France (78210)

Filed Feb. 25, 1975, Ser. No. 553,025
Claims priority, application France, Feb. 28, 1974, 74.06920
Int. Cl.² A01L *1/00*
U.S. Cl. 168—4 **6 Claims**



1. A horseshoe comprising a U-shaped, metallic monoblock structure having a thick inner portion, said inner portion having an upper face, a lower face, lateral inner and outer faces and a transverse section, said transverse section being substantially rectangular; and a thinner outer portion having

nail holes for fastening said horseshoe to the crust of a horse hoof, said outer portion having an upper face, an edge and a width, said upper face of said outer portion being an extension of said upper face of said inner portion, said width of said outer portion being sufficient for said upper face of said inner portion to be in contact with only a sole of a horse's foot, and said lateral inner and outer faces of said inner portion being substantially parallel.

3,957,121

AUTOMATIC CONTROL SYSTEM FOR EARTH-MOVING EQUIPMENT

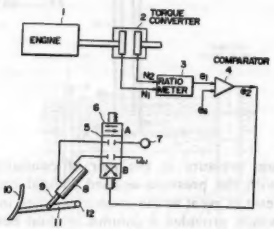
Tashiro Takeda, Higashi, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 22, 1974, Ser. No. 472,279

Claims priority, application Japan, May 28, 1973, 48-59521; May 29, 1973, 48-63079[U]

Int. Cl.² E02F *3/76*

U.S. Cl. 172—4.5 **4 Claims**



1. An automatic control system disposed in earth moving equipment comprising:

a. an earth moving vehicle having an engine, means for propelling said vehicle, and an earth moving blade pivotally coupled to said vehicle;

b. a torque converter, said torque converter having an input shaft coupled to said engine and an output shaft coupled to said means for propelling said vehicle;

c. control means for selectively varying the cutting angle of said earth moving blade, said control means comprising a fluid pressure cylinder coupled to said blade, and valve means coupled to said cylinder; detector means coupled to said torque converter for detecting and transmitting the ratio e_1, equal to the number of revolutions of said input shaft (N_1) divided by the number of revolutions of said output shaft (N_2); comparator means coupled to said detector means and to said valve means, said comparator means for comparing the ratio e_1 to a predetermined value e_s such that said value means is selectively activated by said comparator means thereby causing said cutting angle of said blade to be moved to a predetermined position.

3,957,122

ROTARY PLOUGHS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

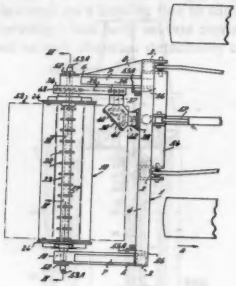
Filed Mar. 4, 1974, Ser. No. 447,940

Claims priority, application Netherlands, Mar. 6, 1973, 7303080

Int. Cl.² A01B *33/00*

U.S. Cl. 172—60 **40 Claims**

1. A rotary plough comprising frame means and at least one elongated rotor mounted on said frame means, said rotor being rotatable about a first substantially horizontal axis of rotation defined by a shaft connected to said frame means, said rotor having at lease one soil-working member comprising a rotatable tine support with a row of tines having active soil working portions, said support being spaced from said shaft and rotatable about a corresponding, substantially horizontal axis that is spaced from said first axis, driving means connected to revolve said rotor and said driving means including a control mechanism that drivingly interconnects said shaft with said support, said control mechanism comprising gear means that establishes a transmission gear ratio and rotates said tines about said corresponding axis responsive to



the revolutions of said rotor about said first axis, the soil engaging position of the soil working member and said tines being rotatable and movable in a forward direction with respect to the normal direction of movement of said rotor, said tines being progressively movable and rotatable about both of the axes to cut, raise and drop lumps of earth in inverted positions.

3,957,123

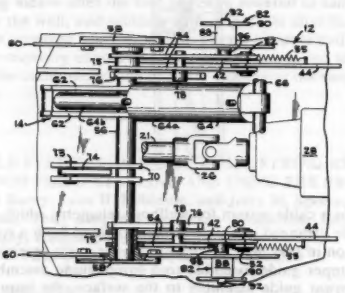
TRACTOR VEHICLE MOUNTED LIFT ASSEMBLY PROVIDED WITH LATCH MEANS

Joseph A. Federspiel, Port Washington, Wis., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 307,918, Nov. 20, 1972, Pat. No. 3,811,338. This application Nov. 30, 1973, Ser. No. 420,475

Int. Cl.² A01B *63/10*, *63/104*, *63/118*; E05C *5/00*

U.S. Cl. 172—481 **1 Claim**



1. A lift assembly for an implement-carrying vehicle having a frame, comprising in combination:

a lift arm mounted on said frame for movement along a vertical path between a raised latched position and a lowered position, said arm having catch means thereon,

an implement connected to said lift arm for vertical movement therewith,

power means carried by said frame and operatively associated with said lift arm for effecting said movement,

latch means mounted on said frame, said latch means including:

a latch bolt having a non-circular body portion and a beveled forward portion defining a substantially planar cam face,

said frame including cooperating bracket means journalling said bolt substantially perpendicular to said lift arm path (1) for limited rotational movement about an axis between a first operative position and a second inoperative position, and (2) for limited movement along said axis between a forward latching position with only a part of said cam face lying in said lift arm path, and a rearward inactive position,

said frame and bracket means including an abutment wall provided with a non-circular opening therethrough complementary to said latch bolt body portion and through which said bolt extends,

a torsion-compression spring about said latch bolt and rotatively and abuttingly engaging said non-circular bolt portion and connected at its other end to said bracket means, said spring relatively biasing said bolt toward said second inoperative position with said non-circular bolt portion and wall opening misaligned thereby to retain said bolt in said rearward inactive position, and,

handle means on said bolt for rotating said bolt to said first operative position with said non-circular portion and opening aligned thereby permitting said spring to axially project said bolt toward said forward latching position and in said lift arm path,

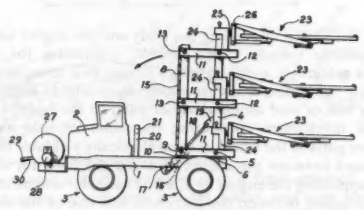
said lift arm in elevating to said raised position by said power means engaging said cam face and deflecting said bolt axially against said spring until said bevelled portion engages said lift arm catch means to latch said arm in raised position and from which said arm may be released by axial shifting of said bolt by said handle means.

3,957,124

TUNNEL-DRILLING TRUCK

Bernard Desourdy, 309 deNormandie St., Longueuil, Quebec, Canada

Filed Jan. 14, 1975, Ser. No. 541,073
Claims priority, application Canada, Aug. 16, 1974, 207170
Int. Cl.² E21C *11/02*
U.S. Cl. 173—28 **4 Claims**



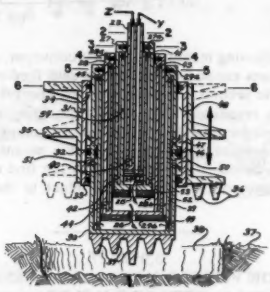
1. A tunnel-drilling truck comprising a vehicle body, wheels and axle assemblies supporting the vehicle body, a rigid mast unit bodily pivoted to the vehicle body about a transverse axis relative to the latter and upwardly projecting endwise from the vehicle body, said rigid mass unit constituted of first and second rigid arms pivoted onto said vehicle body about a pair of parallel pivot axes transverse to said vehicle body, said first and second rigid arms being arranged in parallel spaced-apart relationship one ahead of the other lengthwise of said vehicle body, and centrally transversely of the latter, a series of work platforms extending generally parallel to said vehicle body, each having a pair of laterally spaced-apart portion laterally straddling said first and second rigid arms and pivotally connected to both rigid arms by transverse pins, whereby said first and second rigid arms form a parallelogram arrangement with said work platforms, an actuating device connected to the vehicle body and to the mass unit and operatively bodily pivoting the latter about said transverse axes, said work platforms remaining substantially horizontal irrespective of the inclination of said rigid arms, and elongated drill units mounted on said platforms, said platforms maintaining the drill units in a predetermined aiming relationship independently of the angular position of the rigid arms relative to the vehicle body.

3,957,125

MULTI-STAGE DOUBLE-ACTING EXTENDIBLE AND CONTRACTIBLE SHAFT DRIVE FOR DRILLING DEVICE

Wayne B. Russell, Jr., 3895 Lugo Ave., Lynwood, Calif. 90262

Continuation-in-part of Ser. No. 177,592, Sept. 3, 1971, abandoned. This application Nov. 21, 1973, Ser. No. 418,073
The portion of the term of this patent subsequent to Oct. 30, 1990, has been disclaimed.
Int. Cl.² E21B *3/02*
U.S. Cl. 173—150 **9 Claims**



1. Earth drilling equipment comprising:

an extendible and contractible shaft, comprising at least three shaft members having a common longitudinal axis, drive means operable on one of said shaft members to apply torque for rotating it, each shaft member except the outermost shaft member, being telescoped within the next adjacent outer member,

means preventing relative rotation between adjacent shaft members, each of said three shaft members except the one driven by the drive means having piston means slidably sealed to the inner wall of the next adjacent outer member and providing a series of tandem arranged seal means,

fluid passageways between adjacent shaft members,

means providing fluid communication between adjacent fluid passageways,

a first port means for entry of pressurized fluid, communicating with a side of said seal means for applying pressure in the direction of expansion and a second port means for entry of pressurized fluid, communicating with another side of said seal means for applying pressure in the direction of contraction, whereby application of fluid pressure at said first entry port means extends the length of said shaft and application of fluid pressure at said second entry port means contracts the length of said shaft, and

earth drilling means attached to one of said shaft members other than the member on which the drive means is operable.

3,957,126

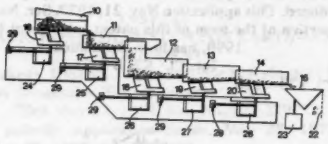
FEED CONTROL SYSTEM

Jack Hobart, Leamington Spa, England, assignor to Hobart Engineering Limited, Stratford-upon-Avon, England

Filed July 17, 1974, Ser. No. 489,494
Claims priority, application United Kingdom, July 17, 1973, 34039/73
Int. Cl.² G01G *13/02*
U.S. Cl. 177—122 **11 Claims**

1. A feed control system, for controlling the operation of a weighing apparatus which includes three or more conveyors

arranged in flow series and arranged to carry product from a feeder to a hopper provided with hopper weight detecting means whereby the product will be separated into batches of predetermined weight, comprising separate feed rate adjusting means operatively connected to the first and second conveyors of the series, separate conveyor weight detecting means operatively connected to the second and third conveyors of said series, a first control means connected to control said

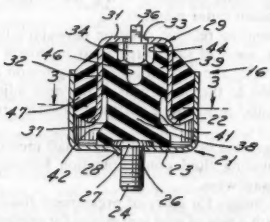


feed rate adjusting means of said first conveyor, and a second control means connected to control said feed-rate adjusting means of the second conveyor, the first control means being operable in response to the weight detecting means of the second conveyor, and the second control means being operable in response to the weight detecting means of the third conveyor, whereby the rate of feed of the first conveyor will be dependent on the weight of product in the succeeding conveyors.

3,957,127
MOTOR VEHICLE STRUCTURE INCLUDING A RESILIENT MOUNT

Richard W. Bouchard, and Charles G. Mangiaracina, both of Livonia, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 12, 1975, Ser. No. 549,248
Int. Cl.² B60K *5/00*; **F16F** *15/08*
U.S. Cl. 180—64 R **4 Claims**



1. Motor vehicle structure comprising:
a frame component,
a powertrain component,
a resilient mounting assembly interposing said frame component and said powertrain component,
said resilient mounting assembly comprising a first cup member secured to one of said components, said first cup member having a wall portion and a base portion,
a second cup member telescopingly received within the first cup member, said second cup member having a wall portion and a base portion and being secured to the other of said components,
said second cup member opening toward the base portion of said first cup member with its wall portion spaced from the wall portion of said first cup member,
the wall portions of said first and second cup members being generally cylindrical and coaxial,
the wall portion of said second cup member having a radially outwardly flanged portion adjacent its free edge,
a first resilient member comprising an elastomeric column interposing the base portions of said first cup member and said second cup member and engaging the wall portion of said second cup member,
a second resilient member comprising an elastomeric annulus interposed between and having its inner and outer surfaces bonded to the wall portions of said first and second cup members, respectively,
said first resilient member including a first portion of a diameter substantially equal to the inside diameter of the cylindrical wall portion of the second cup member,
a second portion axially adjoining said first portion having a smaller diameter than said first portion,
a third portion axially adjoining said second portion having a generally conical shape the greatest diameter of which exceeds the diameter of said first portion,

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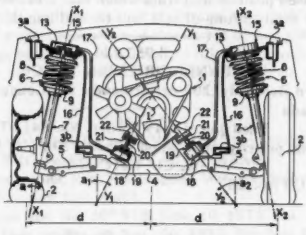
3,957,128
SUSPENSION DEVICE FOR THE BODY AND ENGINE OF AN AUTOMOBILE VEHICLE

Robert Le Salver, Chanteloup-les-Vignes, and Dominique Poupard, Courbevoie, both of France, assignors to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Boulogne-Billancourt, both of, France

Filed May 22, 1975, Ser. No. 579,851
Claims priority, application France, May 27, 1974, 74.18263
Int. Cl.² B60K *9/00*; **B60G** *21/00*
U.S. Cl. 180—64 R **18 Claims**



1. A device for suspending the body and the engine unit of an automobile vehicle having wheels, comprising for each wheel a telescopic shock-absorber having two telescopically relatively movable parts, first elastically yieldable means attaching one of said shock-absorber parts to the body, a suspension mechanism connecting the other of said shock-absorber parts to the wheel, second elastically yieldable means interposed between the engine unit and the body for elastically supporting the engine unit, a first variable-volume chamber interposed between the body and said one of the shock-absorber parts, at least one second variable-volume chamber interposed between the engine unit and the body, and connecting pipes putting the first chambers in communication with the interior of the second chamber.

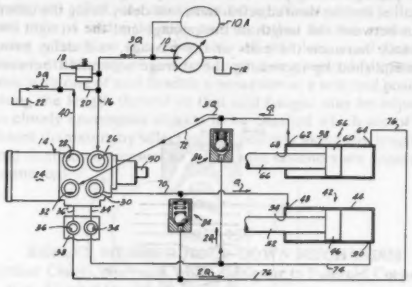
3,957,129
STEERING SYSTEM

Jim L. Rau, Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Feb. 7, 1974, Ser. No. 440,370
Int. Cl.² B62D *5/08*
U.S. Cl. 180—152 **5 Claims**

1. A steering system comprising a set of steering cylinders which when actuated effect steering, said set of steering cylinders comprising at least two proportionately sized cylinders, and steering control means associated with said respective proportionately sized cylinders, said steering control means comprising valve means for directing a first flow to one of said proportionately sized cylinders and a second flow to another of said proportionately sized cylinders to effect actuation thereof, said first and second flows being in accordance with the proportionate sizing of the cylinders, said valve means

receiving the return third flow from said one of said cylinders and the return fourth flow from the other of said cylinders, said steering control means further including a metering means for metering one of said flows, input operator control



means for operating said metering means and valve means upon operator steering, and said valve means including fluid porting for directing one of said return flows to said metering means for metering of said one return flow and for directing said metered return flow to a reservoir.

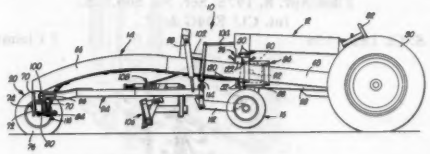
3,957,130
STEERING CONTROL FOR TRACTOR GRADER ATTACHMENTS

Albert A. Hammersmith, c/o Al Hammersmith & Son Mfg. Co., 4th and Central Ave., Horton, Kans. 66439

Continuation-in-part of Ser. No. 276,706, July 31, 1972, Pat. No. 3,881,563. This application July 15, 1974, Ser. No. 488,550

Int. Cl.² B62D *5/00*

U.S. Cl. 180—159 **2 Claims**



1. In a steerable mobile assembly:

a powered vehicle equipped with a fluid-actuated, power steering system and a front wheel and axle structure having a steering mechanism provided with a fluid operated actuator operably coupled with said power steering system;

a tool-supporting frame provided with a ground-engaging front wheel and axle unit having a steering apparatus which includes a fluid-operated actuator;

means releasably securing said frame to said vehicle with said frame extending forwardly of said vehicle wheel and axle structure and supporting the latter in a raised, non-ground-engaging disposition; and

releasable coupling means operably interconnecting the actuator of said frame axle unit steering apparatus in flow communication with the power steering system of said vehicle to render the front wheel and axle unit of said frame responsive to actuation of the power steering system whereby turning movement of the mobile assembly is responsive solely to operation of the steering apparatus of said frame front wheel and axle unit,

said coupling means including selectively positionable flow-directing means,

said flow-directing means being positionable in a first position in which the actuator of said vehicle steering mechanism is rendered nonoperative and the actuator of said frame steering apparatus is rendered operative in response to actuation of the power steering system,

said flow-directing means being further positionable in a second position for rendering the actuator of said vehicle steering mechanism operative in response to actuation of the power steering system when said frame is removed from the vehicle and said coupling means are released to remove the actuator of the frame steering apparatus from said communication.

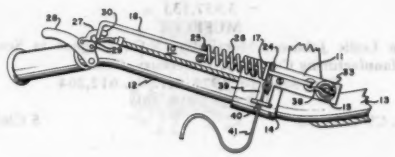
3,957,131
SAFETY IGNITION SWITCH AND BRAKE ACTUATOR

Dwight L. Perkins, Rte. 1, Haines, Oreg. 97833

Continuation-in-part of Ser. No. 297,351, Oct. 13, 1972, abandoned. This application Nov. 19, 1973, Ser. No. 416,907

Int. Cl.² B60K *28/00*

U.S. Cl. 180—99 **5 Claims**



1. A safety ignition switch and brake actuator for motorized apparatus, comprising a housing mounted to handle bars of said apparatus; and a shut-down assembly having a brake lever pivotally mounted over said handle bar adjacent the grip portion and being provided with means for actuating a cut-off switch having means to break the electrical circuit controlling ignition in the apparatus engine when said brake lever is released, said brake and ignition controls on said vehicle include portions thereof shiftable along generally the same path and in corresponding directions between active and inactive positions, said actuating means is a shaft-like member being supported from said vehicle for shifting movement generally along said path, means biasing said actuating means in the direction along said path in which said controls are shifted toward their active positions, a latch means being operatively engaged with said actuating means to retain the latter against movement along said path in the direction in which said controls are shifted to their active positions.

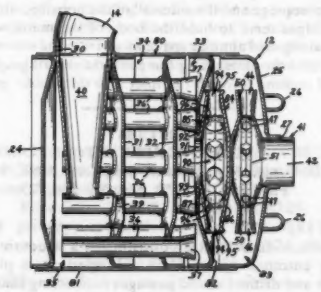
3,957,132
SNOWMOBILE MUFFLER

Ian N. Swanson, Eagan, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Dec. 9, 1974, Ser. No. 530,675

Int. Cl.² F01N *1/08*

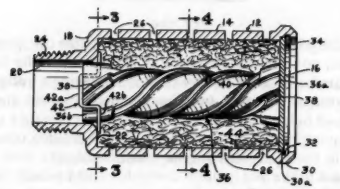
U.S. Cl. 181—57 **8 Claims**



1. In a muffler, in combination:

a housing having a longitudinal axis;
partition means defining with said housing at least one distinct chamber;
means for conducting gases from said chamber;
and means including a radial tubular attenuator for connecting said chamber to a source of traveling fluid having a content of acoustical energy, said means comprising a pair of flat casings contained within a second chamber;
one of said casings having at least one passage for admitting thereto fluids from said source, and a plurality of generally coplanar radially directed passages for providing outward egress of fluids therefrom into said second chamber;
another of said casings having at least one passage for providing egress of fluids therefrom into said one chamber, and a plurality of generally coplanar radially directed passages for admitting fluid thereto from said second chamber.

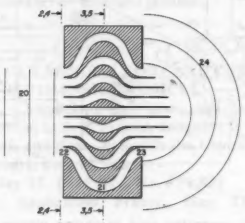
3,957,133
MUFFLER
John Leslie Johnson, Morrisville, N.C., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed Sept. 10, 1975, Ser. No. 612,204
Int. Cl.² F01N 1/08
U.S. Cl. 181—60 **5 Claims**



1. A muffler comprising a hollow cylindrical housing having a sidewall and end walls at either end, one end wall having an axial opening and an inlet connection, said one end wall providing an inwardly-facing annular shoulder surrounding the opening, the other end being imperforate, the sidewall of the housing being formed with aperture means, a corepiece having a diameter approximately equal to the inside diameter of the opening and comprising a thin-walled tubular element being formed with outstruck uniformly spaced helical ridges, the ridges having slots along the peaks thereof for a portion of the length of the ridges, the first end of the tubular element butting against the said other end wall of the housing, retaining means associated with the said one end wall of the housing and engaging the second end of the tubular element to urge said element toward the said other end wall, and a body of metal wool compressed in the annular space between the tubular corepiece and the sidewall of the housing, whereby the helical ridges serve to hold the body of the metal wool from moving along said annular space away from the one end of the housing and the slots along the peaks of the ridges distribute the fluid coming through the inlet into the wool.

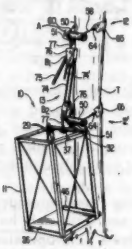
3,957,134
ACOUSTIC REFRACTORS
Donald D. Daniel, 57A Decatur, Ridgecrest, Calif. 93555
Filed Dec. 9, 1974, Ser. No. 530,727
Int. Cl.² G10K 11/00
U.S. Cl. 181—176 **16 Claims**

1. An acoustic refractor consisting of a structure provided with an entrance aperture, an exit aperture, a plurality of separate and distinct sound passages connecting said entrance and exit apertures, the path followed by each said sound passage being such that the direction of said path at the passage entrance is parallel to the direction of propagation of the portion of a sound wave that enters the passage, the refractor being designed to refract said sound wave, said passage having a nondecreasing cross sectional area throughout its length, said passage being provided with any single value of delay required for the desired refraction, said delay being the difference between the length of the passage and the straight line distance between the ends of the passage, said delay being accomplished by increasing the average separation between



adjacent passages over what it would be if they were both straight, said separation being provided by the portion of the structure between said adjacent passages, each said passage having an exit end such that at any point on said exit end the width of the passage measured in the plane of refraction at said point is small enough to provide means producing diffraction without a null in the diffraction pattern throughout the entire angle of refraction at said point, said angle of refraction being the angle between the direction of the passage and the direction of the refracted wave at said point.

3,957,135
CLIMBING DEVICE
Henry G. Lane, 3816 Ave. O, NW., Winter Haven, Fla. 33880
Filed Apr. 8, 1975, Ser. No. 566,625
Int. Cl.² E04G 3/10
U.S. Cl. 182—136 **7 Claims**



1. A device for climbing a tree, pole or other vertically elongated generally cylindrical object, comprising basket means for supporting a human operator, a pair of flexible hangers for encompassing and gripping the object being climbed, and a block and tackle assembly means engageable between one of the hangers and the basket means for use by the operator to lift the basket and operator, said basket means having connecting means for selectively supporting said basket means alternately from the one of said hangers through said block and tackle assembly and from the other of said hangers independent of said block and tackle assembly, said hangers each comprising an elongated roller having a pair of opposite ends, a rigid loop projecting radially from said roller intermediate the opposite ends thereof, friction belt means for partially encompassing said object and being frictionally re-

tained thereon against sliding when tightened against said object, said belt means having a pair of ends and fastener means secured to each of said ends, and a pair of flexible connectors of selected length, each flexible connector having an end affixed to said roller and a free end extending loosely from said roller, one connector being affixed to said roller on one side of said rigid loop and the other flexible connector being affixed on the other side of said loop, said fastener means at the ends of said belt, each being separably connectable with one of said flexible connectors at a selected position along the length thereof so that said hanger may be adjusted to closely encompass objects to be climbed which are of different diameters by selecting the position along the length of said flexible connectors to which said fasteners are separably connected.

3,957,136

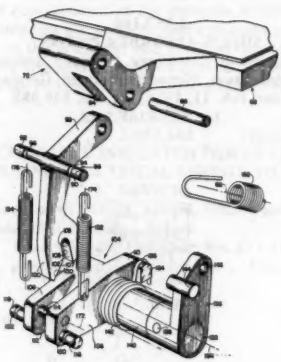
REFLEX MEMBER HOLD-DOWN MECHANISM

Arthur Cianci, Norwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 355,685, April 30, 1973, Pat. No. 3,878,545. This application Dec. 26, 1974, Ser. No. 536,375

Int. Cl.² F03G *1/00;* **G03B** *19/12*

U.S. Cl. 185—39 **18 Claims**



1. Apparatus for use with a reflex camera of the type having an operator assembly movable from a first position whereat it functions as a focusing screen to a second position whereat it functions as a reflex member for reflecting the image of a subject toward an exposure plane, said apparatus including:

drive means;

erecting means coupled to said drive means and adapted to be coupled to said operator assembly for moving said operator assembly from said first position to said second position and thence to said first position and movable between an initial position and an override position whilst said operator assembly remains in one of said first and second positions;

energy storage means for receiving and storing energy from said drive means whilst said erecting means moves between said initial position and said override position; and

cam means connected to said erecting means and biased into engagement with said drive means by said energy storage means for releasably securing said operator assembly in one of said first and second positions.

3,957,137

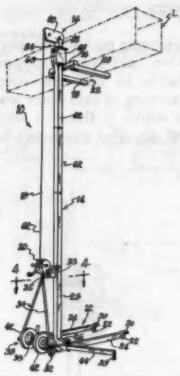
PORTABLE MATERIAL LIFT

Howard H. Vermette, No. 7 - 143rd St., Hammond, Ind. 46320

Continuation of Ser. No. 450,444, March 12, 1974, abandoned. This application June 30, 1975, Ser. No. 591,520

Int. Cl.² B66B *9/20*

U.S. Cl. 187—11 **6 Claims**



2. A portable lift comprising, a base, an upright post supported on said base, said upright post formed of a plurality of detachable sections with the uppermost section having a hollow tubular end, a load supporting platform which includes a carriage member which surrounds the post and is slidably supported on said upright post and load supporting arms connected to said carriage, said load supporting arms extending forwardly of said post, a pulley unit as a single integrally formed structure comprising an elongated pulley housing and first and second pulleys within said pulley housing, means for detachably securing said pulley unit to said uppermost post section, said pulley unit when secured to said post positioning said pulley housing so that a portion thereof extends rearwardly of said post and forms a cantilever, with said first pulley being in substantial vertical alinement with said post and the second pulley positioned rearwardly of said first pulley and with the axes of both said pulleys being in a common horizontal plane and with both pulleys having the same circumference, a winch supported on said post intermediate the pulley housing and base and extending rearwardly of said post, a cable connected to said winch and extending over both said pulleys and extending forwardly and outwardly of said post and continuing downwardly and connected to the carriage of said load supporting platform so that operation of said winch will through said cable cause said load supporting platform to move up or down on said upright post, the portion of said cable extending rearwardly of the post between said second pulley and said winch being at an inclined angle and providing a cantilever force which counterbalances the force of the load at the front of the lift and the portion of the cable extending forwardly of the post between the first pulley and the carriage extending vertically.

3,957,138

AUTOMATIC ADJUSTING DEVICE FOR A BICYCLE

Masayoshi Kine, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Sept. 30, 1974, Ser. No. 510,728

Claims priority, application Japan, Oct. 4, 1973, 48-112548; Feb. 13, 1974, 49-18305; Apr. 4, 1974, 49-39058

Int. Cl.² F16D *65/56*

U.S. Cl. 188—196 F **5 Claims**

1. An automatic adjusting device for a bicycle brake, which exerts the brake by means of stretching of an inner wire of a

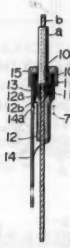
control cable comprising an outer cable and said inner wire, said adjusting device comprising;

a. an adjusting member for retaining in a position one terminal of said outer cable, said adjusting member being provided at the center thereof with a through hole for inserting said inner wire therein and also at the outer periphery of the end portion thereof with a screw thread,

b. a first supporting member supporting said adjusting member,

c. a second supporting member supporting one terminal of said inner wire, said second supporting member being movable relative to said first supporting member by means of stretching of said inner wire,

d. an actuator which is fixed to said second supporting member, said actuator extending toward the retaining



position of one terminal of said outer cable and being provided at the intermediate portion thereof with a control groove, and

e. a clutch spring composed of a coil spring between said actuator and said adjusting member, said clutch spring being engageable at one end thereof with said control groove for permitting said adjusting member to be movable through said spring when the relative movement between said first and second supporting members exceeds a given range of stretch of said wire in action, wherein the control groove of said actuator is made larger in width than a wire diameter of said clutch spring so that a straight end of said clutch spring may be engageable with said control groove for being movable therein, and at the same time, a range of said movement is a proper clearance necessary to exert the brake.

3,957,139

GUIDE FOR MOUNTING A BRAKE LINING ONTO A BRAKE LINING SUPPORT OF A DISK BRAKE FOR VEHICLES

Curt Hochhuth, Minden, Westfalen; Hans Pollinger; Hans Gebhardt, both of Munich, and Corneliu Mircea Popescu, Lohhof, all of Germany, assignors to Knorr-Bremse GmbH, Germany

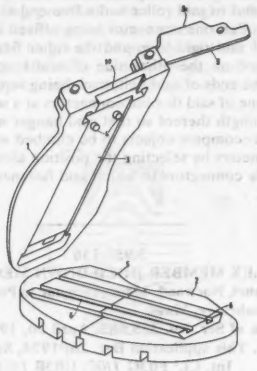
Filed Feb. 6, 1975, Ser. No. 547,739

Claims priority, application Germany, Feb. 23, 1974, 7406362

Int. Cl.² F16D *69/04*

U.S. Cl. 188—244 **5 Claims**

1. In a brake shoe for a disk brake for railway and other vehicles, a brake lining support having a face with means for retaining a brake lining thereon, a brake lining removably retained on said brake lining support face, said retaining means comprisng a dovetail groove in said brake lining support face and a dovetail guide on said brake lining insertable into said dovetail groove, guide means on said brake lining support face groove having a predetermined section, and counter-guide means on a face of said brake lining dovetail guide directed toward said brake lining support face and having an inverted mirror section with respect to said guide



means so as to permit only a particular brake lining to be slidably insertable into a brake lining support.

3,957,140

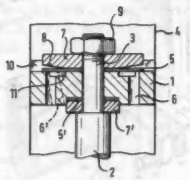
SHOCK-ABSORBER PISTON

Franz Josef Overkott, Gevelsberg, Germany, assignor to Carl Ullrich Peddinghaus, Wuppertal-Barmen, Germany

Filed Feb. 11, 1975, Ser. No. 549,088

Int. Cl.² F16F *9/19*

U.S. Cl. 188—317 **6 Claims**



1. A piston for a shock absorber comprising a piston body having spaced axial end faces and a side wall extending therebetween, a piston rod secured to said piston body, opposed valve ports in said body, a groove formed in each of the axial end faces of said piston body, a pair of said ports opening into the groove formed in one end face of said piston body and opening through the other end face of said piston body at a location spaced from the groove formed in said other face, a second pair of said ports opening into the groove formed in said other end face of said piston body and opening through said one end face at a location spaced from the groove formed in said one end face, resilient valve plates lying wholly within said grooves respectively and overlying the ports opening into said grooves, and rigid support plates, each having an inner face received in a corresponding groove, said support plates having central regions engaging the respective valve plates and end regions adapted to limit opening movement of the respective resilient valve plates with respect to the underlying parts, each said supporting plate having a length at least the same length as its corresponding valve plate, each of said grooves being greater in length than the length of the corresponding supporting plates, said grooves extending completely across the diameter of the axial end faces of the piston body to open through the side wall thereof.

3,957,141

BRIEFCASE

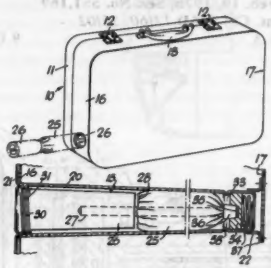
Norbert Domes, 111 Mountainview Road, North Balwyn, Victoria, Australia

Filed Sept. 25, 1974, Ser. No. 509,319

Claims priority, application Australia, Sept. 26, 1973, 5010/73

Int. Cl.² A45C 15/00

U.S. Cl. 190—42 6 Claims



1. A briefcase and umbrella combination including a separate compartment adapted to house the umbrella, an opening in the briefcase communicating with said compartment and shaped and located to permit insertion into, and removal from, said compartment of the umbrella, a first locking element provided on the umbrella, and a second locking element provided on the briefcase, said first and second locking elements being arranged to interlock to retain the umbrella when housed in the compartment and releasable for removal of the umbrella.

3,957,142

ELECTRICALLY INSULATED POWER LINE FOR SUPPLYING ELECTRICAL ENERGY TO MOBILE DEVICES

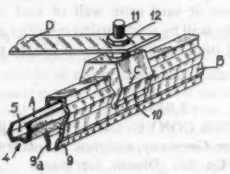
Guy Eugene Gaston Devolle, Arcueil, France, assignor to S. A. Chadefaud, Val de Marne, France

Filed Mar. 10, 1975, Ser. No. 557,172

Claims priority, application France, Mar. 11, 1974, 74.08190

Int. Cl.² B60M 1/34

U.S. Cl. 191—23 A 16 Claims



1. An insulated power line for supplying electrical energy to mobile devices, comprising segments of conducting sections having in cross-section, substantially a shape of an hexagon with a concave side directed downwards to form a contact and guiding surface for a friction piece, said segments of conducting sections being placed in an electrically insulating casing in which they are entirely encased, except on the concave side, on each side of which said casing forms a deep passage for the friction piece, said conducting segments being connected together by means of connection units comprising a cap forming section encasing the segments of the conducting sections on the sides thereof opposite to the concave side, tightening means being designed to block together said conducting sections and said connection unit being contained inside a removable housing provided to encase ends of the electrically insulating casings surrounding the segments of conducting sections which are hung by means of hanging claws comprising a body made of insulating material encasing the insulating casing.

3,957,143

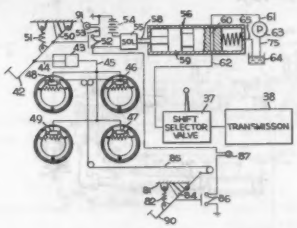
PARKING BRAKE RELEASE FOR TRANSMISSION CLUTCH

John W. Barth, Topeka, Kans., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 19, 1974, Ser. No. 534,566

Int. Cl.² B60K 41/26

U.S. Cl. 192—4 A 6 Claims



1. A vehicle control system comprising, a source of pressurized fluid, a hydraulically actuated vehicle transmission, a transmission shift selector valve for selectively engaging said transmission, a vehicle brake, brake operating means including, a brake lever, a brake actuating means operatively connected between said brake lever and said brake for actuating said vehicle brake, a cutoff valve between said source of pressurized fluid and said transmission, an electrical circuit connected between said brake operating means and said transmission cutoff valve including a brake switch and solenoid, said switch closing for energizing said solenoid for operating said cutoff valve to interrupt communication between said source of pressurized fluid and said transmission for rendering said transmission inoperative when said brake is actuated.

3,957,144

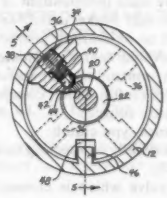
CONTINUOUS ROLLER BRAKE

Martin A. Opyrchal, Charlotte, N.C., assignor to Duff-Norton Company, Inc., Charlotte, N.C.

Division of Ser. No. 397,012, Sept. 13, 1973, Pat. No. 3,873,066. This application Sept. 30, 1974, Ser. No. 510,506

Int. Cl.² F16D 63/00

U.S. Cl. 192—8 R 4 Claims



1. A self-aligning brake for use with a rotating shaft means having a circumferential groove formed therein, said brake comprising a carrier member mounted on said shaft means, a plurality of ball elements carried in said carrier member and circumferentially spaced around said shaft means, biasing means for each of said ball elements biasing each of said ball elements radially inwardly into contact with said shaft means at said circumferential groove therein, said ball elements constituting the sole support for said carrier member, and stationary abutment means disposed for engagement with said

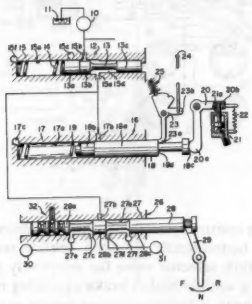
carrier member to restrict the rotational movement thereof and thereby cause said ball elements to apply a braking resistance to rotation of said shaft means in either rotational direction.

3,957,145

CLUTCH CONTROLLING APPARATUS

Shin Kitano, Aichi, and Yutaka Momose, Toyota, both of Japan, assignors to Aisin Seiki Co., Ltd., Japan

Filed Feb. 23, 1973, Ser. No. 335,144
Claims priority, application Japan, Mar. 8, 1972, 47-23781
Int. Cl. F16d *67/04*
U.S. Cl. 192—13 R **9 Claims**



1. A clutch controlling apparatus comprising:

a fluid pressure source for providing a substantially constant fluid pressure;

a fluid pressure type clutch, for transmitting a driving force of the engine to an output axis, actuated by said fluid pressure of said fluid pressure source;

an inching vlave means for controlling the degree to which said fluid pressure type clutch is actuated which is dependent upon the degree to which a brake pedal is depressed, said inching valve means being disposed within a fluid passage between said fluid pressure source and said fluid pressure type clutch; and

limiting means for mechanically inactivating said inching valve means being directly contacted with said inching valve means to prevent movement of said inching valve means so as to maintain said inching valve means in an inoperative state independent of the actuation and deactuation of said brake pedal, said limiting means being positioned to its limiting position by manually operated means provided near the vehicle operator's seat.

7. A clutch controlling apparatus having a clutch fluid pressure control circuit which comprises:

a fluid pressure source;

a fluid pressure type clutch;

a passage fluidically connecting said fluid pressure source to said clutch;

an inching valve which is connected to said passage and which controls the pressure transmitted to said clutch which is dependent upon the degree of depression of a brake pedal;

a spring which continuously biases said inching valve which has a variable orifice disposed between an inlet and an outlet of said passage within said passage in a direction which tends to increase the orifice; and

a regulator valve,

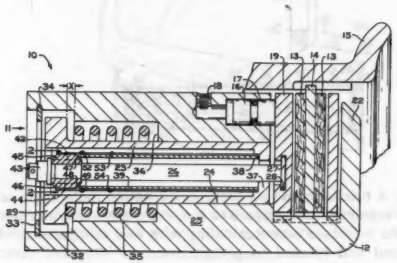
wherein said orifice is increased so as to decrease said fluid pressure provided from said fluid pressure source to said clutch when said inching valve is permitted to operate by means of depressing said brake, whereas said fluid pressure supplied from said fluid pressure source is exhausted from a drain port so as to maintain a predetermined pressure when said brake is not actuated.

3,957,146

AUTOMATIC ADJUSTER WITH CUTTER FOR FRICTION COUPLINGS

Walter J. Le Blanc, Pecos, Tex., assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 19, 1975, Ser. No. 551,169
Int. Cl.² F16D *13/60, 55/02*
U.S. Cl. 192—111 A **9 Claims**



1. An adjuster assembly for regulating the release clearance between two selectively engageable parts such as friction brake or clutch parts to compensate for wear in such parts comprising a pair of generally concentric members, one of said members being tubular with a tube wall, a first member of said concentric members adapted for axial displacement in response to actuation and release movement of its associated engageable parts, a second member of said concentric members being mounted on said assembly for limited axial movement with the corresponding movement of said first member, a cutting member mounted on one of said concentric members for cutting engagement with said member having a tube wall, means to arrest said second member so that said concentric members are adapted for relative axial movement by cutting apart portions of said tube wall of said concentric member having a tube wall by said cutting member an amount equal to the wear of such friction brake or clutch parts.

3,957,147

ROLLER FOR CONVEYOR APPARATUS

Dieter Specht, Dhunn, Germany, assignor to Interroll Fordertechnik GmbH & Co. KG, Dhunn, Germany

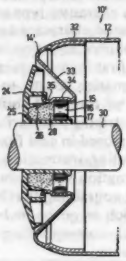
Filed July 22, 1974, Ser. No. 490,370
Claims priority, application Germany, Aug. 1, 1973, 2338950
Int. Cl.² B65G *39/09*; **F16C** *35/00*
U.S. Cl. 193—37 **4 Claims**

1. A roller assembly for conveyor installations comprising a tubular roller casing, roller bearings, a roller bottom secured in each end of said roller casing, a non-rotatable shaft and a dust cover;

said roller bottom including an integral annular flange protruding axially outwardly from the assembly and angled radially outward at its free end to serve as a water deflector;

said dust cover having a series of inwardly extending flanges the first of said flanges being affixed to said shaft with said roller bearing attached thereto, the second of said flanges resiliently sealingly engaging the underside of said roller bottom flanges, said engagement allowing rotational

movement of said roller bottom, and at least one baffling flange at the top of and extending beyond the edge of said



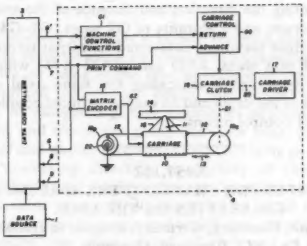
roller bottom flange with said baffling flange not in contact with said roller bottom flange.

3,957,148

LOGICAL SOLUTION FOR MECHANICAL CLUTCH START/STOP WEAR

Charles E. Milliser, and David N. Sitter, both of Waynesboro, Va., assignors to General Electric Company, Waynesboro, Va.

Filed Dec. 26, 1973, Ser. No. 427,657
Int. Cl.² B41J *27/00*
U.S. Cl. 197—1 R **29 Claims**



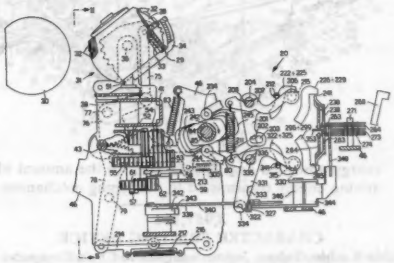
1. In an arrangement wherein a printer is caused to respond to signals representing printable and control characters normally available at a first rate from a source to print the printable characters represented by said signals serially along a line on a record medium at a second rate and for executing the control functions represented by said signals, a print head for printing printable characters in response to printable character signals, means for moving said print head along a line across said record medium in a continuous fashion with controlled interruptions, means for maximizing the extend of continuous movement of said head comprising an N character signal storage register, where N is a plural number substantially less than the maximum number of characters to be printed along said line, means for receiving characters signals from said source and storing them in given locations in said storage register before utilization by said printer, means for insuring that a substantial number of characters are printed along a line before the storage register is empty of the initial N characters and the additional characters received during the printing of the initial N characters comprising said second rate being dimensioned to exceed said first rate by a relatively small percentage such that for every character printed only a fraction of the time required for a character signal to be received elapses, and means responsive to the absence of a stored character signal in the final stage of said register for halting said movement of said print head.

3,957,149

SELECTOR SYSTEM FOR A TYPE-BEARING ELEMENT OF AN OFFICE MACHINE

Rinaldo Salto, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Dec. 26, 1974, Ser. No. 536,406
Claims priority, application Italy, Dec. 28, 1973, 70875/73
Int. Cl.² B41J *23/02*
U.S. Cl. 197—16 **23 Claims**



1. A selector system for a type-bearing element of typewriters, teleprinters, accounting machines and the like office machines comprising an output member connected to the type-bearing element and shiftable for the positioning thereof; a series of cams actuatable between a rest and an operative position; a series of cam follower members associated with said actuatable cams, each cam follower member of said series including a cam follower element cooperative with an associated cam of said series of cams, an output element operatively connected to said output member, and a pivotable element, said cam follower element being positively movable by the associated cam upon actuation thereof in said operative position; support means for freely supporting said cam follower members such that when said cam follower element is moved by the associated cam, the corresponding output element is inoperative over said output member; and selectively actuatable arrest means for arresting the pivotable element of one cam follower of said cam follower members for causing the output element of said one cam follower to positively shift the output member upon positive movement of the cam follower element of said one cam follower by the associated cam actuated in said operative position.

3,957,150

IMPRESSION CONTROL APPARATUS FOR TYPEWRITERS

Samuel D. Cappotto, Syracuse, N.Y., assignor to SCM Corporation, New York, N.Y.

Filed Jan. 8, 1975, Ser. No. 539,490
Int. Cl.² B41J *23/08*
U.S. Cl. 197—17 **23 Claims**

1. An apparatus for controlling the driving energy transmitted to a typing mechanism of a typewriter comprising:

a motor;

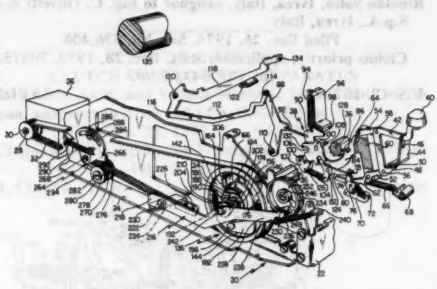
a power roll;

the typing mechanism driven by said power roll when in engagement therewith and free from said power roll when disengaged therefrom;

energy transmitting means for transmitting energy from said motor to said power roll to drive the typing mechanism;

energy absorbing means operatively connected to said energy transmitting means for absorbing a portion of the energy transmitted by said energy transmitting means and retaining said portion of energy until after the typing mechanism disengages from said power roll without transmitting said portion of energy to the typing mechanism; and

adjustable control means operatively connected to said energy absorbing means for controlling said portion of



energy absorbed and thereby control the amount of the driving energy transmitted to the typing mechanism.

3,957,151

CHARACTER PRINTING DEVICE

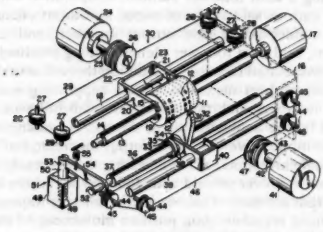
Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1974, Ser. No. 452,973

Claims priority, application Japan, Mar. 24, 1973, 48-33723; July 3, 1973, 48-74396; July 3, 1973, 48-74397; July 3, 1973, 48-74398; Aug. 14, 1973, 48-90505

Int. Cl.² B41J *1/32*

U.S. Cl. 197—49 **6 Claims**



1. A character printing device comprising a printing drum on the peripheral wall of which a plurality of character types are arranged in the axial direction (row) of the drum and in the circumferential direction (column) thereof; a printing information source for generating printing instruction signals for selectively printing any of said character types on the drum on a record medium; a first driving means for shifting the drum along the axis thereof in accordance with the printing instruction signals from the printing information source to position any character type column on the drum opposite a desired character printing position on the record medium; a second driving means for rotating the drum around the axis thereof in accordance with the printing instruction signals from the printing information source to position any character type row on the drum opposite the desired character printing position on the record medium; a hammer disposed close to the drum and opposed to an outer peripheral wall portion of the drum with the record medium interposed therebetween; a third driving means for shifting the hammer at least step by step in a direction parallel with the axis of the drum to determine a character printing position relative to the record medium; and a striking means for striking with the hammer said opposed peripheral wall portion of the drum through the record medium,

the improvement wherein said first driving means comprises:

a first memory means (**81, 91, 187**) coupled with said printing information source to store that signal of the printing instruction signals from said printing information source which represents a character type column containing the last one of the printed character types on said drum;

a character type column selection means (**83, 93, 189**) coupled with said first memory means (**81, 91, 187**) and said printing information source to determine the direction and distance of the axial shift of said drum being moved to face the striking wall surface of said hammer by comparing signals stored in said first memory means (**81, 91, 187**) with printing instruction signals generated by said printing information source and representing a character type column containing that of the character types on said drum which is going to be printed thereby to provide an output corresponding to said determined direction and distance;

a shift control means (**64, 98, 194**) coupled with said character type column selection means (**83, 93, 189**) axially to shift said drum in accordance with the output from said character type column selection means (**83, 93, 189**);

a plurality of column and row lines provided in accordance with the arrangement of the respective character types on the drum; and

means for supplying printing instruction signals generated by said printing information source to said plurality of column and row lines;

said character type column selection menas (**83, 93, 189**) included in said first driving means comprising: a plurality of AND gates (**A11–A44**), each having an input terminal connected to a corresponding one of the plural column lines (I to IV) and another input terminal connected to a corresponding one of the output terminals of said first memory means (**81**), and producing an output signal representing the direction and distance of the axial shift of said drum; and a plurality of OR gates (**G1–G4**), each having input terminals connected to output terminals of those of said plural AND gates (**A11–A44**) which produce output signals indicating the same axial shifting distance of the drum and an output terminal coupled with said shift control means.

3,957,152

APPARATUS FOR CHANGING THE SPACING OF CIGARETTES OR THE LIKE

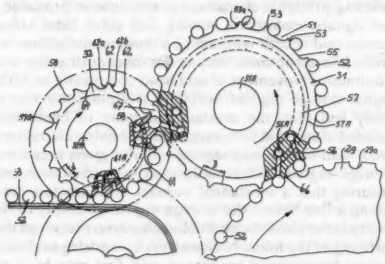
Bob Heitmann, Hamburg, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed Sept. 5, 1974, Ser. No. 503,243

Claims priority, application Germany, Sept. 8, 1973, 2345475

Int. Cl.² B65G *47/26*

U.S. Cl. 198—34 **15 Claims**



1. Apparatus for changing the spacing of rod-shaped articles which travel sideways, particularly for changing the spacing between successive rod-shaped smokers' products which form a row, comprising first and second series of first and second article receiving means wherein the neighboring receiving

means are respectively spaced apart by larger first and smaller second distances; means for respectively moving said first and second series at first and second speeds along first anbd second paths and past a common transfer station at which successive first receiving means are in temporary register with successive second receiving means, the ratio of said first and second speeds being proportional to the ratio of said first and second distances, means for feeding articles into successive receiving means of one of said series ahead of said transfer station; and means for transferring articles from successive receiving means of said one series directly into successive receiving means of the other of said series at said station, the configuration of receiving means of at least one of said series being such that said first receiving means can bypass transferred articles in said second receiving means and vice versa during movement past said transfer station.

3,957,153
PUSHER-TYPE CHAIN FOR CONVEYOR MEANS

Claude B. Krekeler, Cincinnati, Ohio, assignor to The Cincinnati Mine Machinery Company, Cincinnati, Ohio

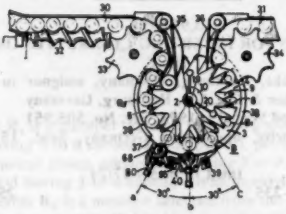
Filed Feb. 13, 1974, Ser. No. 442,245
Int. Cl.² B65G *19/00*
U.S. Cl. 198—168 **41 Claims**

1. A conveyor chain for a mining machine and the like for conveying material along a conveyor in a conveying direction, said conveyor being of the type providing an elongated base with upturned longitudinal edges, said chain comprising a plurality of elongated pusher assemblies adapted to be supported by and travel along said conveyor base, the long axis of each of said pusher assemblies normally lying perpendicular to said conveying direction, a plurality of chain element groups joining said pusher elements together, each of said chain element groups being made up of equal numbers of chain elements at least some of which are joined together by pintle means, the endmost link of each end of each chain element group comprising a strap link, each strap link comprising a generally U-shaped link having a base portion and a pair of legs terminating in enlarged free ends lying in parallel spaced relationship and being provided with coaxial pintle-receiving perforations to permit said strap link to be pivotally affixed to the adjacent link element of its respective link element group by one of said pintle means, each of said pusher assemblies having a pair of diametrically opposed extension means thereon intermediate the ends of said pusher assembly and extending laterally thereof, each of said extension means defining a transverse opening for the receipt of said base portion of the adjacent strap link of the adjacent one of said link element groups, said joinder of said link elements of said groups by said pintle means and said engagement of said strap link bases in said transverse openings defined by said pusher element extension means rendering said pusher chain capable of vertical articulation about the center line of each of said pintles and about the center line of each of said strap link bases, each of said transverse openings being elongated toward the axis of its respective pusher assembly rendering its respective strap link base horizontally shiftable therein whereby said conveyor chain is capable of horizontal articulation at the point of engagement of each strap link in its respective pusher assembly transverse opening and whereby each pusher assembly is capable of horizontal articulation to dodge an obstruction located on said conveyor base adjacent one of said upturned longitudinal edges.

3,957,154
APPARATUS FOR ROTATING BOTTLES

Kikuo Shiba, Osaka, Japan, assignor to Hitachi Shipbuilding and Engineering Co., Ltd., Osaka, Japan

Filed Jan. 13, 1975, Ser. No. 540,589
Claims priority, application Japan, Jan. 29, 1974, 49-12006; Jan. 31, 1974, 49-13201
Int. Cl.² B65G *29/00*
U.S. Cl. 198—209 **11 Claims**

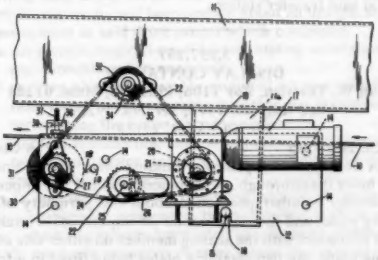


1. An apparatus for rotating bottles comprising a circular turntable rotatable to transfer bottles from an inlet passage to an outlet passage along a circular arc path as successively arranged on the peripheral portion of the turntable at predetermined spacing, means for holding the bottles in position on the turntable while rendering each bottle rotatable about its vertical axis, and at least one rotation imparting means for rotating a bottle on the turntable, the holding means comprising a bottle head holding member and a bottle body holding member mounted on the upwardly projecting portion of the rotary shaft of the turntable, each of the holding members being composed of two toothed disks with one superposed on the other as a pair and having a roller at the end of each tooth of the disks, the teeth of one toothed disk of the pair being out of register with the teeth of the other toothed disk to provide spaces therebetween for receiving the bottles respectively, the distance between the adjacent rollers on the upper and lower toothed disks of the bottle head holding member defining a nipping space which is slightly smaller than the diameter of bottle head, the distance between the adjacent rollers on the upper and lower toothed disks of the bottle body holding member defining a nipping space which is slightly smaller than the diameter of bottle body.

3,957,155
CONVEYOR CLEANING DEVICE

Harvard W. K. Enchelmaier, 4 E. Greenbrook Road, North Caldwell, N.J. 07006

Filed May 29, 1975, Ser. No. 581,725
Int. Cl.² B65G *45/00*
U.S. Cl. 198—230 **9 Claims**



1. A device for cleaning a side of one of the runs of a continuous belt conveyor as it travels, comprising a frame in the form of a first-class lever extending generally parallel to the direction of travel of the belt and mounted adjacent the said

run of the belt on pivot means having its axis transverse to the direction of travel of the belt, a cylindrical belt cleaning brush mounted on a shaft journalled on one end of the frame to rotate on an axis transverse to the direction of travel of the belt, and means selectively to drive the brush, the last-named means being so constructed and arranged that the frame pivots to bring the brush into contact with the said side of the belt when the brush driving means is energized and pivots in the opposite direction to remove the brush from contact with the belt when the brush driving means is deenergized.

3,957,156

APPARATUS FOR INVERTING CIGARETTES OR THE LIKE

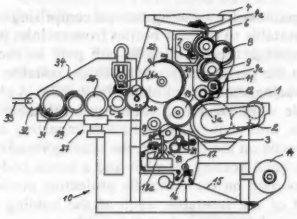
Dieter Schwenke, Hamburg, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed Sept. 13, 1974, Ser. No. 505,951

Claims priority, application Germany, Sept. 15, 1973, 2346511

Int. Cl.² B65G *47/24*

U.S. Cl. 198—235 **25 Claims**



1. A turn-around device for cigarettes or analogous rod-shaped articles, particularly a device for inverting end-for-end one filter cigarette of successive pairs of filter cigarettes of unit length which are moved sideways, comprising a support rotatable about a first axis; reorienting means including at least one inverting element mounted on and rotatable relative to said support about a second axis which is spaced from and parallel to said first axis; means for rotating said support in a first direction whereby said inverting element orbits about said first axis and moves past a transfer station once during each revolution of said support; means for rotating said inverting element about said second axis counter to said direction through **180** degrees during each full revolution of said support; means for feeding non-inverted articles to said inverting element at said transfer station whereby an article which has been fed to said element at said station is turned end-for-end during the next-following full revolution of said support; and means for removing inverted articles from said inverting element at said transfer station.

3,957,157

DISPLAY CONTAINER

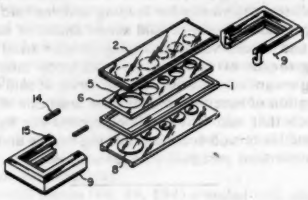
Norman W. Therrien, Box 1106, Pittsfield, Mass. 01201

Filed Aug. 30, 1973, Ser. No. 392,897

Int. Cl.² A45C *11/28*

U.S. Cl. 206—.83 **6 Claims**

1. A container comprising a holding plate having one or more holes therethrough, a continuous resilient, air-impermeable sealing member positioned about the periphery of the holding plate, and first and second air-impermeable retaining plates in contact with the sealing member on either side of the holding plate, the two retaining plates being fitted in a frame defining a channel-section recess which extends about the periphery of the retaining plates and in which edge portions of the retaining plates are received to compress the retaining plates against the sealing member thereby to form air-tight seals between the sealing member and the retaining plates respectively, the frame including at least two frame members both of which are readily movable to permit disassembly of the container and are readily replaceable to facilitate reassembly of the container, and at least one of the retaining plates



being transparent and being formed with a boss of uniform height less than the thickness of the holding plate, the boss protruding into one of the holes in the holding plate and being of substantially the same cross-sectional form as said one hole.

3,957,158

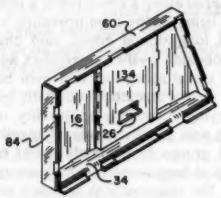
BATHTUB CONTAINER

Lewis D. Poggiali, Owosso, Mich., assignor to Olinkraft, Inc., West Monroe, La.

Filed Dec. 27, 1973, Ser. No. 428,800

Int. Cl.² B65D *85/00*

U.S. Cl. 206—320 **10 Claims**



1. An improved package for completely enclosing a bathtub, comprising:

a. A wrap-around tube member;

b. a pair of end caps, fixedly attached to the ends of said tube member, each end cap comprising:

1. a generally four-sided planar member having formed on at least one side thereof a cushion member hingedly attached thereto so that said cushion member may be positioned to be generally perpendicular to said planar member;

2. a support member positioned on said planar member for supporting the ends of the package and the bathtub whenever similar packages are stacked on top of each other;

c. means, associated with the tube member and the end caps, for fixing the tube member to the end caps; and

d. means for fixing the support member to each planar member comprising at least one locking tab being formed on one of the planar members and being turned inwardly toward the opposite planar member, and the support member having formed therein at least one mating opening so that the locking tab can be positioned in the opening to lock the support member to the end cap.

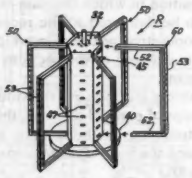
3,957,159
ROTARY STORAGE UNIT

John R. Radek, Hinsdale, Ill., assignor to Ready Metal Manufacturing Co., Chicago, Ill.

Division of Ser. No. 240,163, March 31, 1972, Pat. No. 3,807,788. This application Nov. 26, 1973, Ser. No. 418,835

Int. Cl.² E05B 73/00; A47F 5/02

U.S. Cl. 211—4 8 Claims



2. A rotary storage and dispensing unit, comprising

a. a column,

b. means mounting said column for rotary movement about its vertical axis,

c. a frame consisting of pairs of vertically aligned beams extending radially from said column adjacent its top and bottom with a vertical strut bridging the upper and lower extremities of each pair of aligned beams for defining radial wedge-shaped compartments, with supporting seats in said column and struts, respectively, and

d. wedge-shaped containers detachably mounted within said compartments, said containers having rearwardly and laterally extending projections engageable, respectively, with the seats in the column and struts, to provide three-point container support,

e. the vertically aligned beams and the bridging strut therebetween forming an open framework which defines the radial wedge-shaped compartments, said strut being a plate-like member having oblique, downwardly extending slots forming seats for said laterally extending container projections,

f. said plate-like member being of bilateral section with said oblique slots in each side of said member, for receiving the laterally extending projections of the containers in adjacent compartments at selected levels, in direct interlocking engagement with said strut.

3,957,160
PROCESS FOR THE PREVENTION OF PRECIPITATIONS IN WATER OR AQUEOUS SOLUTIONS

Walter Ploger, Hilden, and Karl-Heinz Worms, Dusseldorf-Holthausen, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

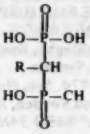
Filed Jan. 26, 1972, Ser. No. 221,041

Claims priority, application Germany, Feb. 1, 1971, 2104476

Int. Cl.² C02B 5/06

U.S. Cl. 210—58 3 Claims

1. A process for inhibiting the precipitation of insoluble salts from aqueous solutions comprising adding to an aqueous solution containing a precipitable salt, a sequestering agent selected from the group consisting of (a) N-substituted aminomethane -1,1-diphosphonic acids having the formula



wherein R is a member selected from the group consisting of piperidino, morpholino, pyrrolidino, piperazino and

wherein R_1 is a member selected from the group consisting of alkyl having 1 to 6 carbon atoms, phenyl, phenylalkyl having 7 to 9 carbon atoms, alkylphenyl having 7 to 9 carbon atoms, cycloalkyl having 5 to 6 carbon atoms, pyridyl, and pyrrolyl; and wherein R_2 is a member selected from the group consisting of hydrogen and alkyl having 1 to 6 carbon atoms, (b) alkali metal salts of said acids, (c) ammonium salts of said acids, and (d) mixtures thereof, in a molar ratio of 5×10^{-4} to 5×10^{-2} mols of said agent per mol of precipitable salt cation in said aqueous solution.

3,957,161
ROTARY CRANE

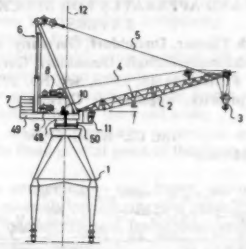
Hans Tax, Potsdamer Strasse 3, 8 Munich 40, Germany

Filed July 15, 1974, Ser. No. 488,894

Claims priority, application Germany, Aug. 9, 1973, 2340428

Int. Cl.² B66C 23/84

U.S. Cl. 212—69 4 Claims



1. In a rotary crane having a base portion, a boom-carrying portion, and drive means for rotating said boom-carrying portion relative to said base portion about an upright axis, the improvement in said drive means which comprises:

a. an electric squirrel-cage motor rotating continuously in one direction when energized;

b. a drive element rotatably mounted on one of said portions and drivingly engaging the other one of said portions for rotating the boom-carrying portion;

c. motion-transmitting means operatively interposed between said motor and said drive element, said motion-transmitting means including

1. an electromagnetic coupling having an input shaft operatively connected to said motor and an output shaft operatively connected to said drive element,

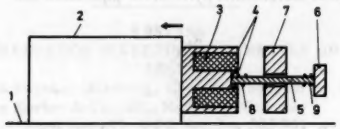
2. manually operable control means for varying slip in said coupling and for thereby varying the torque transmitted from said motor to said drive element; and

d. brake means for braking said drive element when said coupling does not transmit significant torque to said drive element.

3,957,162
METHOD AND DEVICE FOR DISPLACEMENT OF A WORKPIECE

Anton L. O. Söderqvist, Vallingby, Sweden, assignor to LKB-Produkter AB, Bromma, Sweden

Filed Apr. 5, 1974, Ser. No. 458,404
Claims priority, application Sweden, Apr. 6, 1973, 7304862
Int. Cl.² B65G *35/00*
U.S. Cl. 214—1 R **23 Claims**

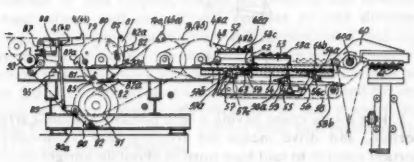


12. In a device for displacement in a given direction of a workpiece slidably resting on a supporting surface, the static coefficient of friction between the workpiece and surface exceeding the dynamic coefficient of friction comprising, a body mounted on said workpiece for reciprocatory movement, electrically energized means mounted on said workpiece for inducing movement of said body in one direction from a position at rest to a second position, stop means on said workpiece at said second position to absorb an impact force upon contact with the body to move the workpiece, force imparting means mounted on said workpiece for imparting an opposite reaction force less than said impact force on said body at said second position to move the body to a third position beyond said position at rest and for imparting to the body at the third position another reaction force to return the body to a position at rest.

3,957,163
METHOD AND APPARATUS FOR STOCKING STOCK IN LAYERS

Hans-Ulrich Tänzler, Dusseldorf, Germany, assignor to Schloemann Aktiengesellschaft, Dusseldorf, Germany

Filed June 25, 1973, Ser. No. 373,302
Claims priority, application Germany, June 23, 1972, 2230715
Int. Cl.² B65G *57/04*
U.S. Cl. 214—6.5 **9 Claims**



1. Apparatus for mechanically stacking sections in layers, which sections are delivered transversely to their length, the apparatus comprising:

at least one conveyor for conveying sections transversely to their length,

means for separating the individual sections from one another,

a rotary member, after the separating means, for turning the individual sections over, at will,

turning means on the rotary member, the turning means defining a section-engaging and retaining recess, for receiving successive sections from the conveyor and turning the respective sections about their longitudinal axes as the section is carried around the rotary member,

means for rotating the rotary member,

a second conveyor disposed at the delivery side of the rotary member for receiving the sections from the turning means, the second conveyor having projecting dogs for engaging the sections and removing them from the turning means,

means for driving the second conveyor such that the portion of the conveyor adjacent to the rotary member moves in the opposite direction to the adjacent portion of the rotary member,

at least one pass-over means on the rotary member for lifting sections above the turning means and thereby preventing delivery of the sections to the recess of the turning means, and for conveying the sections unturned to the second conveyor,

actuating means for moving the pass-over means from an inoperative position in which the pass-over means allows the sections to be delivered to the recess of the turning means to an operative position in which the pass-over means prevents delivery of the sections to the recess of the turning means,

means for assembling the sections individually and successively into groups of parallel sections, the section in each group either touching or there being a predetermined distance between the individual sections,

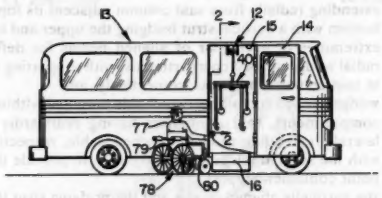
a stacking table, and

a single stacking device for stacking the respective groups of sections on the stacking table.

3,957,164
WHEELCHAIR HOIST AND CARRIER

Joseph H. Brown, 1020 Riverside Drive, Holly Hill, Fla. 32017

Filed Oct. 16, 1974, Ser. No. 515,411
Int. Cl.² B60P *1/54*
U.S. Cl. 214—75 H **5 Claims**



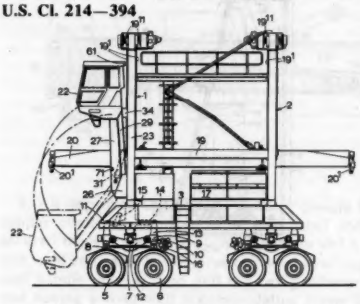
1. A wheelchair hoist and carrier comprising a rail, means mounting said rail on the underside of a vehicle roof entirely within the vehicle and in alignment with a door of the vehicle, one end of the rail being disposed adjacent said door, a boom, trolley means supported by the rail and movably supporting the boom for reciprocating movement beneath the rail between a retracted position entirely beneath the rail and a projected position with an outer end of the boom disposed outwardly of said rail end and said door, a first electrically driven means for propelling said boom in either direction along the rail, a winch, a cable wound on said winch and having an end depending from said outer end of the boom, a sling suspended from said cable end and adapted to be detachably connected to a wheelchair, and a second electrically driven means for revolving said winch in either direction whereby said sling and a load supported thereby can be raised or lowered by said second electrically driven means and conveyed translationally in either direction by said first electrically driven means, said control unit including a handle and a head, a plurality of normally open pushbutton switches interposed in the circuits of said first and second electrically driven means, said switches being supported by the head and protruding from a top surface thereof, and a plate supported for rocking movement by said head and disposed above said switches, for selectively closing the switches when the plate is rocked in a direction for depressing a part thereof located above a selected switch.

3,957,165

STRADDLE CARRIERS

Richard Terence Smith, Wolverhampton, England, assignor to Rubery Owen Mechanical Equipment, Staffordshire, England

Filed Dec. 19, 1974, Ser. No. 534,307
Claims priority, application United Kingdom, Dec. 20, 1973, 59266/73
Int. Cl.² B60P 3/00
U.S. Cl. 214—394 17 Claims



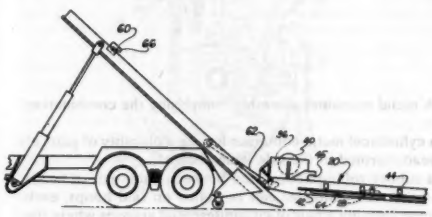
1. A straddle carrier comprising a power driven wheeled structure, means for steering said wheeled structure, power-operated, load-lifting equipment mounted on said wheeled structure, a control cab supported by said wheeled structure and movable relative thereto between at least two alternative positions of which one is an elevated position from which the straddle carrier is controlled when in use, and the other is a lowered position in which said control cab is located at or adjacent to ground level where it is available for access and servicing, and selectively operable power means carried by said wheeled structure which are operatively connected to said control cab whereby said control cab is moved between said alternative positions and which includes manually controlled means for varying operation of said power means and thereby the speed of movement of said control cab between said alternative positions.

3,957,166

ADAPTER APPARATUS FOR CONTAINER TRANSPORTING VEHICLES

R. Richard Durham, 618 E. Dominion Blvd., Columbus, Ohio 43214

Filed Apr. 14, 1975, Ser. No. 567,756
Int. Cl.² B60P 1/64
U.S. Cl. 214—505 5 Claims



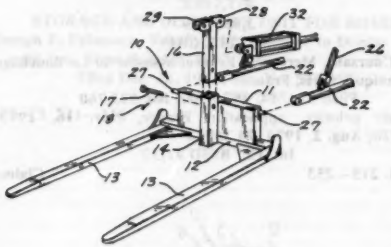
1. An adapter apparatus for container transporting vehicles comprising, in combination, a base means including a longitudinally extending rail provided with a plurality of spaced hook stations, each of said hook stations including a pair of opposing hook members and a pivotally mounted shuttle member adapter to selectively close a respective hook member relative to receiving a connecting device while permitting the connecting device to engage the other hook staton for causing selected movement of the base means in a given direction, said base means including guide means adapted to receive a container provided with cooperating guide members for accurate positioning of said container on said base means and a winch means mounted on said base means including a cable adapted for releasable engagement with a container to pull said container onto said base means.

3,957,167

TRANSPORTING DEVICE

Calvin L. Jacobson, and William H. Ahlers, Jr., both of Harlan, Iowa, assignors to Harlan Mfg. Co., Inc., Harlan, Iowa

Filed Aug. 16, 1974, Ser. No. 498,184
Int. Cl.² B66F 9/00
U.S. Cl. 214—766 5 Claims



1. An item transporting device, adapted to be connected to a tractor three point hitch of the type having two parallel draft arms with rearwardly extending ends and a fixed pivotal point above and between the draft arms, comprising:

a laterally extending frame;

at least one longitudinally extending fork lift member attached to said frame and extending rearwardly therefrom;

first means for pivotally connecting the frame to the rearwardly extending ends of the draft arms;

a connection member pivotally connected at one end thereof to the fixed pivotal point of the three point hitch; and

second means connected to said frame, above said first means, for pivotally connecting the other end of said connection member to said frame, said second means comprising:

a sleeve connected to said frame;

a post member slidably received in one end of said sleeve;

means for releasably fixing the position of said post member with respect to said sleeve; and

an apertured forwardly extending plate affixed to one end of said post member pivotally connected to said connection member.

3,957,168

SEALED THERMOPLASTIC BOTTLE

Dennis F. Shine, Huntington Beach, Calif., and Gunther W. Torau, Buffalo Grove, Ill., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 427,197, Dec. 21, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,571
Int. Cl.² B65D 1/02
U.S. Cl. 215—1 C 8 Claims

1. A thermoplastic sterile blow-molded and hermetically sealed bottle comprising a main body, a bottom, said main body at the top thereof converging upwardly and inwardly terminating in two confronting flattened portions providing a

relatively constricted area, a wider portion above said constricted area, a cylindrical portion above said wider portion,

and said cylindrical portion terminating in an integrally formed web means.

3,957,169

BOTTLE CAP

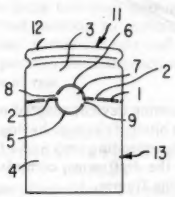
Henri Coursaut, Mercurey, France, assignor to Le Bouchage Mecanique, Paris, France

Filed Nov. 14, 1974, Ser. No. 523,760

Claims priority, application France, Nov. 16, 1973, 73.40820; Aug. 2, 1974, 74.26954

Int. Cl.² B65D *41/32*

U.S. Cl. 215—253 **7 Claims**



1. A bottle cap comprising a sheet member having a crown and a skirt, said member having formed therein a first plurality of perforations defining a first line of weakening which extends substantially around said skirt and divides said skirt into upper and lower portions, said member further having formed therein a second plurality of perforations defining a second line of weakening which extends only part-way around said skirt, which begins and ends at spaced apart locations on said first-named line, and which defines with a part of said first-named line between said locations an area on said skirt connected to each of said upper and lower portions by at least one bridge point between adjacent perforations.

3,957,170

SUPPORTING DEVICE FOR A RIGID VEHICLE-BORNE HEAT-INSULATED TANK

Michel Kotcharian, Paris, France, assignor to Technigaz, Paris, France

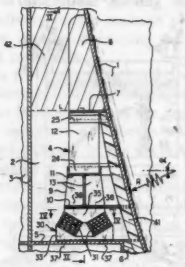
Filed Mar. 26, 1975, Ser. No. 562,059

Claims priority, application France, Apr. 3, 1974, 74.11783

Int. Cl.² B65D *25/18*

U.S. Cl. 220—9 LG **13 Claims**

1. A device for supporting on any conveying vehicle a rigid tank for containing a fluid the temperature of which is very different from the ambient temperature, comprising a continuous annular bearing foot-plate with an at least approximatively flat bottom surface which is substantially horizontal with respect to said vehicle, said bearing foot plate surrounding said tank and being integral therewith; and a base stand secured to the structure of said vehicle and forming a resilient suspension-carrying springer means surrounding said tank, said base stand having an upper seating platform provided with a horizontal seating top surface, said bearing foot-plate resting on said seating top surface, wherein the improvement consists in that heat insulating material is interposed between said bearing foot-plate and said seating platform and consists



of intermediate heat insulating blocks juxtaposed end to end in series to form a discontinuous ring-like pattern while leaving spacing gaps between the successive adjacent blocks, respectively, said blocks having top walls forming an at least approximatively uniform surface, said bearing foot-plate engaging said surface in slidable contacting relationship.

3,957,171

CONTAINER WITH ROLLING HOOPS

Richard Dean Besser, Hudson, Ohio, assignor to Inland Steel Company, Chicago, Ill.

Filed May 9, 1975, Ser. No. 576,094

Int. Cl.² B65D *7/42*

U.S. Cl. 220—71 **5 Claims**

1. A metal container assembly comprising the combination of

a. a cylindrical metal container having a plurality of pairs of beads formed in the side walls thereof,

b. a rubber rolling hoop fitted between each pair of beads so that the container can be rolled on said hoops, each hoop forming a pair of circumferential grooves where the hoop can be clamped to the drum,

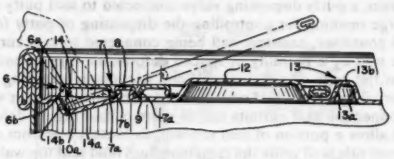
c. a pair of metal retaining rings fitted within the grooves in each hoop for clamping the hoop to the container,

d. and a fastener threaded onto one end of each retaining ring and having a hole extending therethrough for receiving the second end of the ring, said second end of the ring being threaded with a nut screwed thereon and against said fastener for drawing the ring through said fastener and tightly against the hoop and container so as to clamp the hoop to the container.

3,957,172
END PANEL FOR NESTED TAB SAFETY CLOSURE

Gary K. Hasegawa, Morton Grove, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed July 14, 1975, Ser. No. 595,657
Int. Cl.² B65D *41/32*
U.S. Cl. 220—269 6 Claims

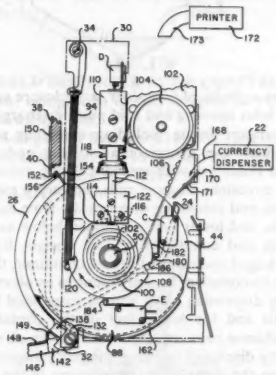


1. An improved child-resistant safety closure for a can or similar container comprising an end panel and a pull tab secured thereto and having a nose portion and a handle portion, said end panel having protrusions obstructing grasping of said handle portion, said pull tab being substantially planar and having a rivet well accommodating tilting said pull tab relative to said end panel, the improvement comprising: tilt enhancing recess means formed in said end panel beneath the tab whereby said pull tab may be tilted into the recess means in order that said handle portion may be grasped, thereby permitting opening of said container.

3,957,173
USER ACCESS COMPARTMENT FOR AN AUTOMATED TELLER MACHINE

Melvin T. Roudebush, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed June 26, 1974, Ser. No. 483,472
Int. Cl.² E05G *7/00*
U.S. Cl. 221—15 17 Claims



2. In an automated teller machine having a protective cabinet means having an opening therein through which items like cash means having an opening therein through which items like cash and receipts can be dispensed, the improvement comprises:

a dispensing module positioned in said machine adjacent to said opening;

said module having a compartment means pivotally mounted therein, for receiving and dispensing said items, and having means for rotating said compartment means between a receiving position and dispensing position relative to said opening in response to a control

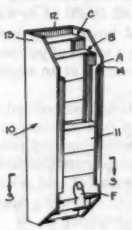
a protective door means pivotally mounted in said dispensing module and having means for rotating said door means between closed and opened positions which close and open said opening respectively in response to said control means so as to enable a user of said machine to gain access to said items when said door means is in said opened position and said compartment means is in said dispensing position:

said means for rotating said door means enabling said door means to remain in said opened position for a predetermined amount of elasped time prior to automatically closing said door means upon the expiration of said elapsed time, and for enabling a user of said machine to selectively initiate closing said door means prior to the expiration of said elapsed time.

3,957,174
STORAGE AND DISPENSER UNIT FOR BOXES

Joseph P. Palamara, Tenafly, N.J., assignor to Display Originals, Inc., West Babylon, N.Y.

Filed Dec. 16, 1974, Ser. No. 532,858
Int. Cl.² A47F *1/08*
U.S. Cl. 221—111 1 Claim



1. A storage and dispenser unit molded of rigid material and adapted to receive rectangular boxes comprising:

A. a back wall:

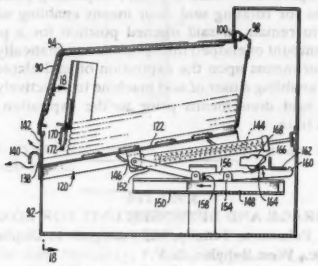
B. a pair of side walls secured to the edges of the back wall to define a vertical channel therewith, said side walls being rectangular in form and having their corners chamfered; and

C. a series of rectangular ledges secured to and projecting inwardly from each side wall to divide the channel into parallel sub-channels for accommodating said boxes, said series of ledges consisting of a front ledge, an intermediate ledge and a rear ledge, said sub-channels being provided at their lower ends with feet projecting laterally from the ledges to prevent the boxes from sliding out, the leading edges of the ledges being staggered with respect to the back wall to form discharge openings for lateral removal of said boxes, the ledges in the series being of progressively increasing width whereby the long sides thereof are staggered with respect to the back wall, each ledge in the series beginning with the narrowest front ledge registering with a like-shaped slot in the next ledge, the last ledge in the series registering with a like-shaped slot in the back wall whereby the unit is free of undercuts and can be injection-molded in a one-piece operation.

3,957,175
NEWSPAPER VENDING MACHINE

Roger G. Gordon, Richmond, Calif., assignor to Safe Rack, Inc., San Leandro, Calif.

Continuation-in-part of Ser. No. 361,791, May 18, 1973, abandoned. This application Aug. 22, 1974, Ser. No. 499,476
Int. Cl.² G07F 11/16
U.S. Cl. 221—215 **5 Claims**



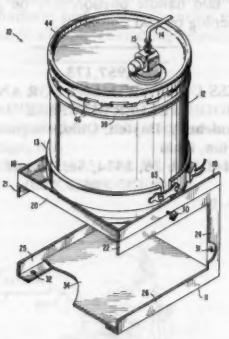
3. A newspaper dispensing machine having in combination:
a. container for a plurality of newspaper stacked horizontally, said container having a front wall,
b. a dispensing mechanism mounted under said stack of newspapers, said dispensing mechanism including a slide with means for moving said slide from a first position directly under said stack of newspapers, to a second position displaced horizontally toward said front wall, said slide carrying a series of pointed members extending upwardly and forwardly at an angle of about 45° to said slide,
c. cam means for raising said pointed members as said slide advances from the first position to the second position, said cam means retracting said pointed members as said slide moves from the second position to the first position,
d. a slot in said front wall of said vending machine near the bottom thereof, said slot being approximately the thickness of a single newspaper.
e. a plurality of downwardly extending members mounted behind said front wall and over said slot, said members being spaced from said front wall and from the bottom of said stack of newspapers whereby said members will permit the bottom newspaper of said stack to move out through said slot but will prevent a second newspaper from being pushed through said slot,
f. said slide including a forward upwardly turned lip extending outside of the dispensing machine and the slot in the front wall of the said dispensing machine has a hinged door thereon, said hinge being at the top thereof, said upturned lip normally holding said door shut when the slide is in the first position and permitting said door to swing open when said lip is moved away from said door.

3,957,176
DISPOSABLE PUTTY DISPENSER

Lloyd Marston, Atlanta, Ga., assignor to Dynatron/Bondo Corporation, Atlanta, Ga.

Continuation of Ser. No. 123,561, March 12, 1971. This application Oct. 13, 1972, Ser. No. 297,252
Int. Cl.² B67D 5/54
U.S. Cl. 222—185 **9 Claims**

1. A dispensing apparatus for dispensing viscous putty or the like comprising a normally closed substantially cylindrical upright disposable metal container with a top wall and a bottom wall and a curved side wall, a body of putty or the like normally filling said container from its bottom wall toward its top wall, a disposable follower inside said container comprising a generally flat body portion normally disposed approximately parallel to said top and bottom walls and normally resting on the top surface of the putty in the container and an annular flange extending upwardly from the edge of said body portion adjacent the inside surface of said curved side wall, said top wall defining an air inlet opening therein, a source of air pressure communicating with said air inlet opening, pressure control means for controlling the air pressure in said container, said bottom wall defining a putty discharge opening therein, a putty dispensing valve connected to said putty discharge opening for controlling the dispensing of putty from said container, said top wall being connected to said curved side wall by a plurality of spaced deformable lugs extending from the edge of said top wall and frictionally engaging the external surface of said curved side wall of said container with a connection that permits one or more of said lugs to deform and allow a portion of said top wall to move away from said curved side wall while the remaining lugs hold said top wall on said curved side wall upon an excessive air pressure being present in said container, thus forming an air passage between said top wall and said curved side wall of said container at the deformed lugs to relieve the excessive air pressure in the container without permitting said top wall to be removed from said curved side wall, said air inlet opening and said putty discharge opening in said top and bottom walls being offset from each other with one of said openings being positioned at the longitudinal centerline of the cylindrical container and the other of said openings being offset from the longitudinal centerline of the cylindrical container, and closure caps for closing said air inlet opening and said putty discharge opening, a container support frame including container support rails normally oriented in a horizontal attitude and arranged to support said container with said dispensing valve protruding below said container support rails, upwardly extending legs connected to and extending downwardly from said container support rails, and lower feet positioned below said container support rails and connected to said upright legs, whereby putty is packaged and shipped in said container, the container is placed on its container support frame in an elevated position so the putty dispensing valve will be suspended between the support rails and the lower feet of the container support frame, the closure caps are removed from the air inlet opening and the putty discharge opening, the putty dispensing valve is connected to the putty discharge opening in the bottom wall and a source of air pressure and the pressure control means are connected to the air inlet opening in the top wall, and substantially all of the putty is dispensed from the container by opening and closing the dispensing valve without removing the top wall from the container, and one or more of the deformable lugs of said top wall will deform when a predetermined pressure is exceeded in the container to form an air passage between the top wall and the side wall of the container above the body of putty at the deformed lugs to relieve the excessive air pressure in the container without permitting the top wall to be removed from the curved side wall.

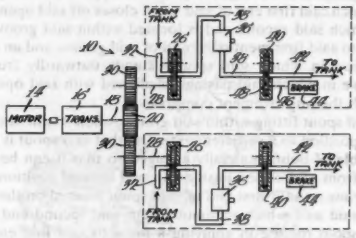


3,957,177

METERING APPLICATOR APPARATUS WITH PRESSURE REGULATING BYPASS

Leroy C. Walls, Valparaiso, Ind., assignor to Leroy C. Walls, Chesterton, Ind.

Filed Nov. 1, 1974, Ser. No. 520,031
Int. Cl.² G01F *11/00*
U.S. Cl. 222—318 **11 Claims**



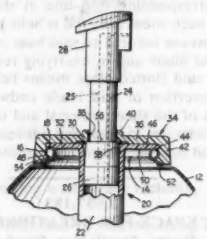
1. In a metering applicator apparatus having a base, a motor mounted on said base and operatively connected to a transmission, a shaft driven by said transmission and having a pinion keyed thereon, constant displacement gear pump means driven by said pinion, means for conveying compound from a tank to the input of said gear pump means, the output of said gear pump means being connected to an applicator gun and to an inlet of a pressure regulating device, said pressure regulating device having a pair of meshing gears into which the compound from the gear pump means is fed, brake means connected to one gear of the pressure regulating device for controlling the amount of compound motored through said gears of said pressure regulating device, the outlet of said pressure regulating device is connected with said tank whereby the metered volume and pressure of compound available at the applicator gun is the differential between the amount of compound discharged from the constant displacement gear pump means and the amount of compound bypassed back to the tank by the brake controlled pressure regulating device.

3,957,178

HAND-HELD DISPENSER PUMP CONSTRUCTION

Wolf Steiman, Bridgeport, Conn., assignor to VCA Corporation, Greenwich, Conn.

Continuation-in-part of Ser. No. 476,039, June 3, 1974. This application Sept. 26, 1974, Ser. No. 509,485
Int. Cl.² G01F *11/32*
U.S. Cl. 222—321 **1 Claim**



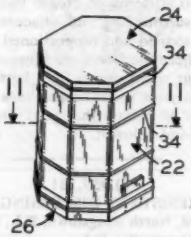
1. In a hand-held dispenser pump device including a container having an open top comprising a circular rim surrounding an opening, said rim having an annular shoulder extending around its exterior, a pump cylinder and a protruding plunger carried thereby, said cylinder at its mouth having an annular, outwardly extending mounting flange supported adjacent its periphery on the top of said rim, the improvement comprising:
   a. a one-piece, snap-on plastic closure comprising an inverted, dish-shaped member having a flat disk-like body provided with a central opening through which the plunger extends and in which it is reciprocatable, said mounting flange being disposed against and engaged by the underside of the disk-like body;
   b. said member including a depending peripheral flange provided with an internal, annular detent bead adapted to engage the underside of said shoulder of the container rim; and
   c. said flange having a height equal to at least twice the spacing between the body and the annular detent bead, whereby the lower portion of the flange serves as a reinforcement to prevent vertical cracks in the flange when the detent bead is pried downward past the annular shoulder on the container.

3,957,179

BULK MATERIAL CONTAINER WITH POURING SPOUT

Robert A. Bamburg; Farris N. Duncan, both of West Monroe, and Roger M. Floyd, Monroe, all of La., assignors to Olinkraft, Inc., West Monroe, La.

Continuation-in-part of Ser. No. 432,946, Jan. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 288,899, Sept. 14, 1972, Pat. No. 3,791,562. This application July 12, 1974, Ser. No. 488,085
The portion of the term of this patent subsequent to Feb. 12, 1991, has been disclaimed.
Int. Cl.² B67D *3/00*
U.S. Cl. 222—528 **7 Claims**

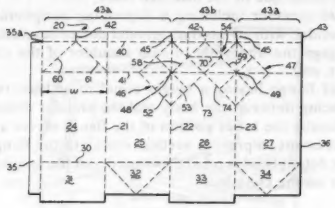


1. A bulk material container comprising
an enclosed vertical outer wall,
a bottom,
a band encircling a bottom portion of the outer wall,
a recloseable pouring spout including a pair of opposite first doors formed in the outer wall and hinged at respective vertical score lines to swing outwardly in opposite directions about the vertical score lines to form an opening in the outer wall between the score lines, said recloseable pouring spout also including a second door formed in the band and hinged at a horizontal score line to swing outwardly about the horizontal score line, said first doors having a size designed to swing through the opening formed in the band by the second door and to maintain the second door swung outward, said first and second doors defining an opening in the container for said pouring spout to dispense contents from the container,
a valve member vertically slidable between the outer wall and the band and having a size designed to be movable into said opening in the container between the pair of first doors when the first doors are open to stop the dispensing of contents from said container, and
a liner telescoped in the outer wall and having an opening aligned with the opening in the container.

3,957,180
POUR SPOUT

Jack J. Skillman, 727 E. 60th Street, Chicago, Ill. 60637

Filed Aug. 6, 1975, Ser. No. 602,297
Int. Cl.² B67D 5/00
U.S. Cl. 222—528 12 Claims



1. A pour spout for a square or rectangular top on a container made from a blank comprising a pair of diamond patterns of score lines centered on adjacent corners, with a rectangular pattern of lines nested between said diamond patterns, said container having a connecting flap along the perimeter of the top with a releasable area centered in said rectangular pattern.

9. A process of forming a container spout comprising the steps of:

a. forming crease lines for enabling at least one end of said container to be formed into at least a section of a rectangular parallelepiped, there being at least two adjacent intersections of said orthogonal lines which intersections form adjacent corners of the parallelepiped section,

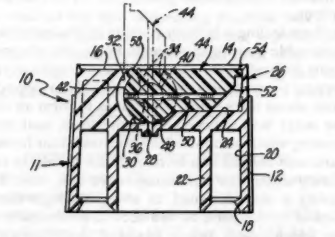
b. forming two patterns of crease lines both above and below, and surrounding said adjacent corners, said patterns being shaped and proportioned to extend a spout when the adjacent corners are squeezed together, and

c. forming pour spout crease lines between said adjacent corners, said pour spout crease lines being shaped and proportioned to retract the spout when pressure is applied above and below it.

3,957,181
CHILD RESISTANT DISPENSING CLOSURE

Robert E. Hazard, North Kingstown, R.I., assignor to Polytop Corporation, Slatersville, R.I.

Filed Feb. 13, 1975, Ser. No. 549,720
Int. Cl.² B65D 25/46
U.S. Cl. 222—534 5 Claims



1. A dispensing closure having a cap and a spout, said cap including mounting means adapted to be attached to a container, a top connected to said mounting means an elongated groove having ends located within said top, one end of said groove being located adjacent to the periphery of said top, the other end of said groove being spaced from the periphery of said top, and means for rotatably supporting said spout so that said spout can be rotated about a substantially horizontal axis, said cap having an opening leading through said top into said groove adjacent to said other end of said groove, said spout being an elongated member having first and second ends and a passage extending between said ends, said spout including means for rotatably mounting said spout so that said spout can be rotated about said axis, said first end of said spout being rotatably mounted on said top by engagement of both of said means for rotatably mounting, said second end of said spout being capable of being manipulated between a closed position in which said first end of said spout closes off said opening and in which said second end is located within said groove adjacent to said first mentioned end of said groove and an opened position in which said spout extends outwardly from said groove in which said passage is aligned with said opening in which the improvement comprises:

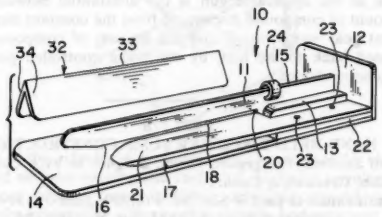
said spout fitting within said groove when it is in said closed position to a sufficient extent so that said spout is incapable of being manually engaged so that it can be moved from said closed position to said opened position,

means on said first end of said spout located on the side of said axis which is remote from said second end of said spout for use in applying a force to said first end when said spout is in said closed position so as to rotate said spout about said axis from said closed position to a sufficient extent so that said second end of said spout can thereafter be manually engaged to be moved from said closed position to said open position, said means for use in applying a force being incapable of manual engagement, and being located generally beneath the uppermost extremity of said cap.

3,957,182
PLEAT FORMING DEVICE

Joseph P. Sambus, 1079 Mosefan St., Franklin Square, N.Y. 11010

Filed July 21, 1975, Ser. No. 597,764
Int. Cl.² A41H 43/00
U.S. Cl. 223—35 9 Claims



1. A pleat forming device which comprises a base means, a blade supported by said base means in predetermined spaced-apart relation to a reference surface, said blade having an edge defining a corresponding fold line in sheet material to be pleated when such sheet material is held against said blade, a slotted plate means secured to said base means in underlying relation to said blade and in overlying relation to said reference surface, said slotted plate means being disposed to accommodate insertion of said blade endwise into preformed pleating loops of the sheet material and to retain portions of the material adjacent such loops between the slotted plate means and said reference surface.

3,957,183
BACKPACK FOR BREATHING TANKS

Donald L. Gadberry, Huntington Beach, Calif., assignor to U.S. Divers Company, Santa Ana, Calif.

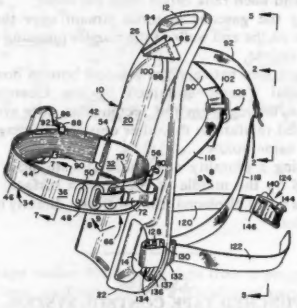
Filed Mar. 14, 1974, Ser. No. 451,097
Int. Cl.² A45F 3/00
U.S. Cl. 224—5 W 9 Claims

1. Apparatus for carrying a tank of breathing gas on the back of a user comprising:

a back plate having a conformation suitable for receipt of a tank of breathing gas thereon;

a band assembly which has an adjustable linkage therewith for securely affixing the breathing gas tank to the back plate;

a harness comprising shoulder straps and chest straps secured to the back plate and connected by a securement fixture comprising overlying and underlying loops, wherein said upper loop is formed of four transverse



members extending across two spaced axial members and one of said transverse members forms a lifting handle that does not form a bight with any portion of the straps, said lower loop being a substantially rectangularly shaped loop, and wherein said shoulder strap is looped around both of said loops and fastened for securement thereof, and said chest strap is looped over a transverse member of said upper loop and under and through said lower loop of said securement fixture for securing it thereto.

3,957,184

BACK PACK WITH RESILIENT BANDS FOR SPACING THE PACK FROM THE WEARER

Daniel A. Shurman, 6440 Valley View, Oakland, Calif. 94611

Filed Aug. 19, 1974, Ser. No. 498,406

Int. Cl.² A45F *3/04*

U.S. Cl. 224—8 R **13 Claims**

1. In a back pack of the type used by hikers and climbers as a body-carried container for transporting articles, said back pack including

a sack-like bag having wall means including

a floor,

side wall means attached to, surmounting and extending upwardly of the floor, said side wall means including a front wall means oriented to face the back of a wearer of said back pack, and a closure for the bag;

frame means and means attaching said frame means flatly to said front wall means to impart structural rigidity to the bag and to obviate vertical collapse of said front wall means;

the improvement wherein said frame means comprises a pair of elongated, blade-like bands disposed contiguously to cross one another and to define an X-configuration at a crossover zone thereof, said bands being independent of auxiliary frame members interconnecting opposed upper and lower diagonally opposed extremities of the bands to one another;

a pair of fastening means interconnecting the bands to one another in the crossover zone to preclude scissors-like movement of the bands relative to each other; and

means to maintain said bands in an arcuate curvature along the length thereof, thereby to provide a zone of spatial separation between the front wall means of the back pack and the back of a wearer of the back pack.

3,957,185

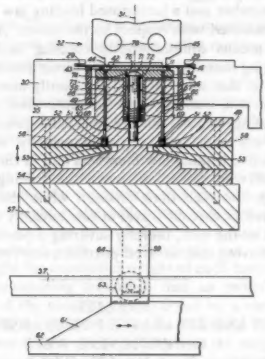
METHODS OF AND APPARATUS FOR THERMOCOMPRESSION BONDING WITH A COMPENSATING SYSTEM

Ronald D. Kauffman; Bennett L. Koppenhaver, and Fred J. Schneider, all of Allentown, Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,535

Int. Cl.² H01L *21/88*

U.S. Cl. 228—106 **10 Claims**



1. In a method of bonding leads to an article, the improvement comprising the steps of:

positioning the article on a supporting member and on the first ends of a plurality of elongated members slidable through the supporting member and having second ends mounted to spring elements, and locating the article during its positioning between guides fixed to the supporting member;

urging the surface of the supporting member flush with the surfaces of the first ends of the elongated members prior to bonding the leads to the article; and

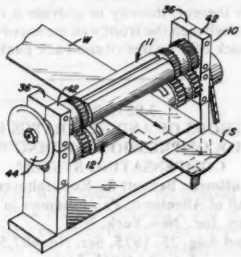
moving the supporting member with the guides and the article during bonding to prevent damage to the guides, and further sliding the surfaces of the first ends of the elongated members through the supporting member during bonding to permit the spring elements to compensate for irregularities in the article to reduce stresses introduced into the article to reduce cracking thereof.

3,957,186

METHOD AND APPARATUS FOR TEARING SECTIONS FROM A WEB

Donald Babcock, Oak Lawn, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 377,352, July 9, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 556,998
Int. Cl.² B26F 3/00
U.S. Cl. 225—3 12 Claims



1. Apparatus for severing separate sections from a web which is continuously fed therethrough comprising:

frame means;

tearing means rotatably mounted in the frame means and including two opposed rotatable pairs of web-engaging, resiliently-mounted members, each pair having a trailing jaw member and a juxtaposed leading jaw member pivotally mounted with respect to the driven jaw member;

driving means simultaneously rotating said pairs of web engaging members in opposite directions relative to each other so that said opposed, resiliently-mounted members engage said web at about the same time; and

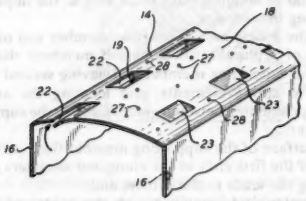
accelerating means shifting said juxtaposed leading jaw members substantially simultaneously away from the respective trailing jaw members and in the general direction of web movement when the trailing jaw members engage the web therebetween while the web-engaging extremities thereof travel at substantially the same linear speed as the web, thereby severing a portion of said web and moving said severed portion away from said web.

3,957,187

METHODS AND APPARATUS FOR TRANSPORTING AND CONDITIONING WEBS

James Puigrodon, Road No. 523, Whitehouse Station, N.J. 08889

Filed Feb. 11, 1975, Ser. No. 548,900
Int. Cl.² B65H 17/32
U.S. Cl. 226—7 13 Claims



11. A method for transporting and conditioning a web comprising:

a. discharging gaseous material from generally rectangular slots on a plurality of nozzles,

b. providing convex, arcuate Coanda Effect indentations on an end wall of nozzles for the gaseous material to flow over immediately adjacent to the rectangular slots,

c. providing a convex Coanda Effect surface on the end walls of the nozzles to receive the gaseous material leaving the convex arcuate indentations,

d. arranging the rectangular slots alternately in staggered relation to other opposite rectangular slots on the same nozzle,

e. arranging the plurality of nozzles in top ranks and bottom ranks and each rank offset from the other,

f. passing the gaseous material stream over the convex surface on the end walls of the nozzles pursuing a Coanda Effect course,

g. passing a web between the top and bottom nozzles on a Sinusoidal Course sustained by the Coanda Effect, streams, issuing from the rectangular slots arranged in staggered relation to the other opposite rectangular slots on the same nozzle,

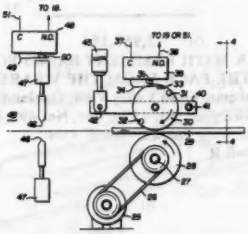
h. disposing a plurality of orifices at both sides of a line defined by the middle of the convex surface, but such orifices being displaced from positions directly in front of each slot.

3,957,188

PUNCHED TAPE CONTROL SYSTEM

John W. Papsdorf, Lake Orion, Mich., assignor to Cardinal of Adrian, Inc., Dryden, Mich.

Division of Ser. No. 477,753, June 10, 1974, Pat. No. 3,915,040. This application July 23, 1975, Ser. No. 598,475
Int. Cl.² B65H 25/16, 17/40
U.S. Cl. 226—9 6 Claims



1. Apparatus for advancing, feeding, measuring and cutting to length stock in response to a program on a tape, said tape having a plurality of parallel longitudinal tracks, one of said tracks having sprocket holes for advancing said tape, said tape including a plurality of data bits, each bit being defined as a transverse portion of the tape having a length sufficient to include only one sprocket hole, the improvement comprising:

a tape reader including an incrementally advancing drive sprocket for engaging the sprocket holes and incrementally advancing the tape one data bit at a time, said tape reader including means to sense the presence or absence of perforations in each track and provide an output in response thereto;

means for advancing said stock a predetermined distance in response to the presence of a sprocket hole; and

means activated by the advancing of said stock said predetermined distance for enabling said drive sprocket to advance said tape another data bit;

whereby the number of consecutive data bits having only a sprocket hole is proportional to the length of stock to be advanced by the apparatus.

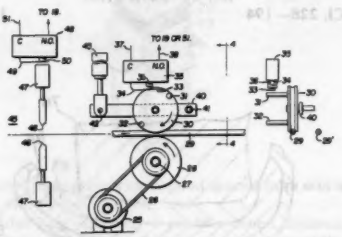
3,957,189
PUNCHED TAPE CONTROL SYSTEM

John W. Papsdorf, Lake Orion, Mich., assignor to Cardinal of Adrian, Inc., Dryden, Mich.

Division of Ser. No. 477,753, June 10, 1974, Pat. No. 3,915,040. This application July 23, 1975, Ser. No. 598,471

Int. Cl.² B65H *25/16*

U.S. Cl. 226—9 **2 Claims**



1. In a tape reader for sensing data from a program on an elongated tape, said tape having a plurality of parallel tracks with one of said tracks having sprocket holes for advancing the tape, the tape including a plurality of data bits each bit being defined as the information contained in all the tracks in a transverse portion of the tape which includes only one sprocket hole, the improvement comprising:

a selectively operable stepping switch for coupling power to a drive sprocket for rotating the drive sprocket incrementally to advance the tape to the next sprocket hole;

enabling switch means operable in response to the presence of a sprocket hole and the absence of any other data in said data bit for actuating said stepping switch.

3,957,190
CASSETTE TAPE LOADING APPARATUS

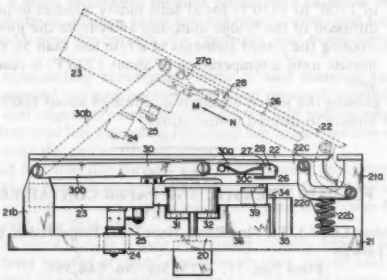
Motoi Yagi, Zushi, and Satoshi Hara, Kanagawa, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 9, 1974, Ser. No. 513,233

Claims priority, application Japan, Oct. 18, 1973, 48-117303

Int. Cl.² G03B *1/56*

U.S. Cl. 226—89 **5 Claims**



1. Apparatus comprising:

a cassette tape including a case body,

a tape housed within the case body,

a member slidably movable relative to the case body,

a pair of poles fixed to the member to guide the tape and an engaging portion provided upon the member,

a tape travelling device having a tape driving mechanism and a tape travelling path,

a bucket for receiving the cassette,

supporting means mounted on the tape travelling device to be swung between a first position in which the cassette is loaded and a second position in which the tape to be delivered out from the cassette is inserted in the tape travelling path,

an engaging member movably connected to the supporting means so as to be engaged with the engaging portion of the member, and

means for moving the engaging member to cause the tape to be delivered out from the cassette through the member when the supporting means is swung from the first position to the second position.

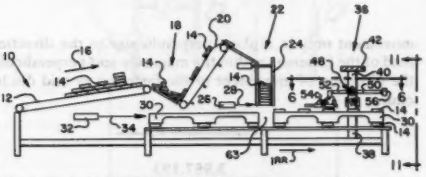
3,957,191
AUTOMATIC FASTENING SYSTEM

William B. Nelson, Jr., West Monroe, La., assignor to Nelson Enterprises, Inc., West Monroe, La.

Filed Jan. 6, 1975, Ser. No. 538,910

Int. Cl.² B27F *7/22*

U.S. Cl. 227—100 **15 Claims**



1. An automatically adjustable fastening system for use in fastening deck boards to stringers in a pallet-making machine or the like, comprising:

a. a frame

b. a plurality of fastening guns pivotably mounted on said frame, each fastening gun having associated therewith a counterweight;

c. means, associated with said fastening guns, for positioning said guns on the pallet deck boards, said positioning means automatically permitting said guns to raise and lower as the height of the pallet deck board changes due to individual variance in each deck board, said counterweight associated with each fastening gun serving to counterweight the combined weight of each fastening gun and each positioning means so that an initial upward movement of the fastening gun caused by a variation in the height of the pallet will not be followed by a rapid downward movement of the pallet gun as the height of the pallet decreases, said counterweight also preventing said fastening guns from dropping between succeeding pallets and deck boards passing beneath the guns;

d. means, associated with said guns, for automatically firing said guns in a controlled manner as the pallet passes beneath the guns to thereby fasten the deck boards to the stringers.

3,957,192
FASTENER-DRIVING TOOL

Hellmuth Fehrs, Hamburg, Germany, assignor to Joh. Friedrich Behrens Metallwaren-Fabrik, Ahrensburg, Germany

Filed Sept. 26, 1974, Ser. No. 509,433

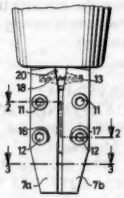
Claims priority, application Germany, Nov. 2, 1973, 2354740

Int. Cl.² B25C *5/06*

U.S. Cl. 227—123 **8 Claims**

1. A fastener-driving tool having a magazine to receive fasteners having a fastener outlet and a discharge chute communicating with said outlet receiving the fasteners fed from the magazine outlet, said discharge chute having a wall located opposite the outlet of the magazine comprising two wall members each movable between a position restricting the

discharge chute and a fastener release position, said wall members defining a gap between them when moved to said release position through which said discharge chute is accessible, and wall support means supporting said wall members for



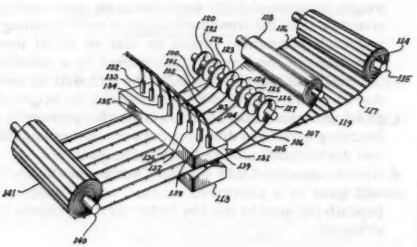
movement only in a plane perpendicular to the direction of feed of the fasteners within the magazine and perpendicular to the direction of movement of the fasteners in said discharge chute.

3,957,193

METHOD FOR CONSTRUCTING AN EASILY STORABLE AWNING

John C. Broderson, 3017 W. Almeria, Phoenix, Ariz. 85009

Continuation-in-part of Ser. No. 474,815, May 30, 1974, Pat. No. 3,886,646. This application Jan. 9, 1975, Ser. No. 539,792
The portion of the term of this patent subsequent to June 3, 1992, has been disclaimed.
Int. Cl.² B23K *31/00*
U.S. Cl. 228—182 **3 Claims**



1. A method for forming an awning of any given width and length, said method comprising the steps of:

a. transporting a plurality of longitudinally oriented wires through an attaching machine;

b. placing a length of sheet of material adjacent the longitudinally oriented wires for transportation to the attaching machine;

c. positioning a plurality of laterally oriented wires adjacent the sheet of material for transportation to the attaching machine; and

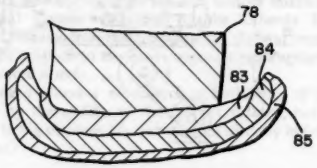
d. attaching the longitudinally oriented wires, the laterally oriented wires and the sheet with the attaching machines to form the unitary structure.

3,957,194

LIQUID INTERFACE DIFFUSION METHOD OF BONDING TITANIUM AND/OR TITANIUM ALLOY STRUCTURE

James R. Woodward, El Cajon, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Continuation of Ser. No. 388,740, Aug. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 99,961, Dec. 17, 1970, which is a continuation-in-part of Ser. No. 765,156, Oct. 4, 1968. This application June 13, 1975, Ser. No. 586,696
Int. Cl.² B23K *31/02*
U.S. Cl. 228—194 **19 Claims**



1. A method of liquid interface diffusion bonding of a pair of titanium based alloy elements which comprises the steps of:

a. depositing on the faying surface of at least one of said elements sequentially lamina of copper and nickel, to form a laminate thereon, the amount of copper and nickel each consisting of substantially 50% of said laminate to form a diffusion bridge material;

b. placing together the faying surfaces to be bonded with said bridge material there between;

c. subjecting said faying surfaces to sufficient positive pressure to maintain position and alignment for joining; and

d. heating said elements in a protective atmosphere at a temperature rate increase of about 100°F. per minute to a temperature of about 1400°F. to bring the thermal gradients in said elements to less than about 50°F.;

e. decreasing the rate of heating of said elements to about 20°F. per minute until a temperature of about 1600°F. is reached to bring the thermal gradients in said elements to less than about 20°F.;

f. decreasing the rate of heating of said elements to about 2°F. per minute to allow time for diffusion of the bridge materials until a temperature in the range of 1700° to 1750°F. is reached;

g. maintaining the temperature of said elements in the range of 1700° to 1750°F. for at least ninety minutes to permit diffusion of the bridge materials away from the joint;

h. cooling the joined elements at a rate less than 50°F. per minute until a temperature of about 1200°F. is reached; and

i. cooling the joined elements at a rate of about 100°F. per minute to desired temperature.

3,957,195

FOLDABLE PLASTIC AND PAPER CONTAINER ASSEMBLY

Tenhon Lin, 53, Tai Ping Road, Hsin Tien, Taipei Hsien, China /Taiwan

Filed Jan. 27, 1975, Ser. No. 544,395
Int. Cl.² B65D *5/40*
U.S. Cl. 229—14 B **5 Claims**

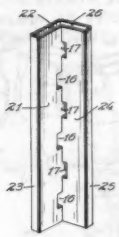
1. A foldable plastic and paper container assembly characterized in that the container assembly is formed by rolling up a sheet of thick paper or a piece of corrugated board and the like into a hollow polygonal or cylindrical body open at both ends, comprising:

an inner plastic bag located inside of the cylindrical body and having a top end located outside of said body;

an outer plastic bag located outside of the cylindrical body;
a first belt of hot-melt adhesive on the outer surface of the body for sealing said inner bag top end to the body and to an area of said outer bag;
a second belt of hot-melt adhesive for sealing the outer bag to the body at a location spaced from said first belt adhesive;

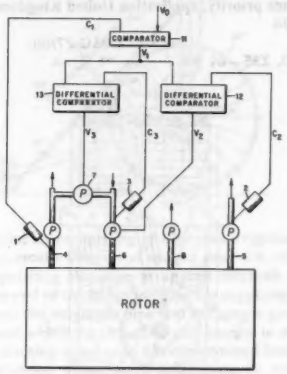
said outer bag having a closed end spaced from said second belt of hot-melt adhesive; and
said outer bag extending a predetermined distance from said belts of adhesive and being wrapped about the body outer surface to form a protective film over that outer surface and thereby isolate that surface.

3,957,196
CORNER PAD
Jack F. Kellerman, Decatur, Ala., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.
Filed Feb. 19, 1975, Ser. No. 551,043
Int. Cl.² B65D *25/12*
U.S. Cl. 229—14 C **2 Claims**



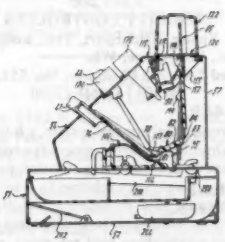
1. A blank made from foldable paperboard or similar sheet-like material adapted to be erected into a corner pad for use in cushioning the corners of a container, said blank comprising:
a substantially rectangular sheet of said material having parallel top and bottom edges and opposed parallel lateral edges perpendicular to said top and bottom edges;
a first fold line extending from said top to said bottom edge near the center of said sheet;
said first fold line formed with interruptions, said interruptions comprising spacer tabs defined by three-sided rectangular line cuts extending in both directions away from said first fold line;
said blank having a pair of parallel, closely spaced hinge lines located at equal distances on each side of said first fold line thereby defining a pair of inner pad panels, one on each side of said first fold line;
said pairs of hinge lines arranged vertically and each said pair defining a narrow intermediate panel extending between each of the hinge lines in each of said pairs of hinge lines; and
an outer pad panel at each lateral edge of said blank, said outer pad panels defined by the lateral edges of said blank and the respective adjacent pair of hinge lines, said blank thereby having four large panels and two narrow intermediate spacer panels.

3,957,197
CENTRIFUGE APPARATUS
Walter K. Sartory, and John W. Eveleigh, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Filed Apr. 25, 1975, Ser. No. 571,814
Int. Cl.² B04B *11/02*
U.S. Cl. 233—4 **6 Claims**



1. The method of operation of a continuous flow centrifuge for separating entrant whole blood into a red cell fraction, a white cell fraction and a plasma fraction, said centrifuge including a feed line for said entrant whole blood and extraction lines for each of said fractions, said method comprising continuously measuring the hematocrit of entrant whole blood in said feed line and continuously adding a separated fraction from one of said extraction lines to said feed line to continuously regulate the entrant whole blood hematocrit at a selected value.

3,957,198
TOY CASH REGISTER
James E. Thomson, Pleasant Lake, Mich., assignor to Western Stamping Corporation, Jackson, Mich.
Filed Aug. 28, 1974, Ser. No. 501,166
Int. Cl.² G06C *27/00*
U.S. Cl. 235—1 E **32 Claims**



1. A toy cash register having a supporting structure and including a keyboard section, said section having openings therein for the slidable reception of pushbuttons, characterized by the combination which comprises paired pushbutton and indicator target portions formed as relatively stiff integral

parts of a single piece of plastic, said parts being joined to each other by a relatively flexible integral medial section, said parts being slidable, in paths lying at an angle to each other, toward and from an apex area in the vicinity of said flexible medial section, the medial section being located by and reacting against the supporting structure to transmit motion between said pushbutton and indicator target portions.

3,957,199

NAVIGATIONAL AIDS

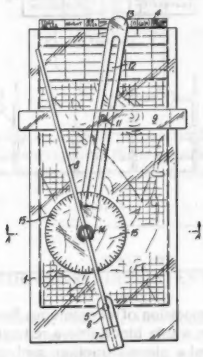
Clive Bromley Hunter, 3 Bushy Road, The Glade, Fetcham, Leatherhead, Surrey, England

Filed Mar. 4, 1975, Ser. No. 555,133

Claims priority, application United Kingdom, Mar. 5, 1974, 9787/74

Int. Cl.² G06C *27/00*

U.S. Cl. 235—61 NV **7 Claims**



1. A course correction calculator comprising

a base member for supporting a map;

a first elongate member mounted for pivotal movement over the map about a first point on said map;

a slidable member carried by said first elongate member and movable longitudinally thereof;

a second elongate member pivotally attached to said slidable member and mounted for pivotal movement about a second point on the map spaced from the first pivot point, said second elongate member being slidable longitudinally with respect to at least one of its pivot points; and

means movable with the slidable member to indicate the angle between the longitudinal axes of the first and second elongate members.

3,957,200

HUMIDITY CONTROLLER

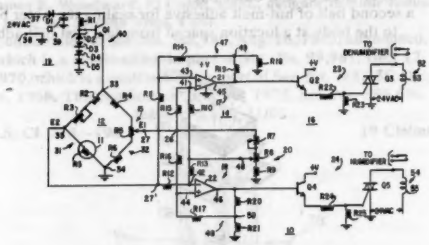
Geoffrey Allen Young, Bridgeport, Tex., assignor to Johnson, Controls, Inc., Milwaukee, Wis.

Filed Feb. 20, 1975, Ser. No. 551,097

Int. Cl.² G05D *22/00*

U.S. Cl. 236—44 R **15 Claims**

1. In an environmental control system, a humidity controller responsive to a humidity sensing means for controlling apparatus of the system to provide compensation for changes in the humidity within a given area relative to a set point as sensed by a sensing means, said humidity controller comprising a sensing network including said humidity sensing means and set point means for establishing said set point, said sensing network being operable to provide a differential output indicative of the relative humidity within the area, and control means including first and second threshold detecting means and threshold means including said setpoint means for establishing different turnon thresholds for said first and second threshold detecting means to enable said control means to provide a first control for said system apparatus in response to a differential output of one polarity provided by said sensing network and



a second control signal for said system apparatus in response to a differential output of the opposite polarity provided by said sensing network.

3,957,201

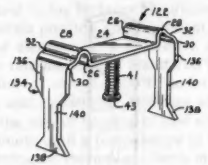
CONCRETE RAILROAD TIE ANCHOR STRUCTURE

Edwin O. Johnson, Kansas City, Mo., and Thomas S. Carter, Overland Park, Kans., assignors to The Kansas City Southern Railway Company, Kansas City, Mo.

Filed Oct. 11, 1974, Ser. No. 514,089

Int. Cl.² E01B *9/02*

U.S. Cl. 238—298 **7 Claims**



1. Anchor structure for use in securing a railroad rail to a concrete tie, said structure comprising:

a base plate adapted to be disposed in a generally horizontal position on the tie;

upwardly projecting shoulders rigid with said base plate at opposite sides thereof and extending away from said plate to cooperate therewith in presenting a seat for said rail;

a bridging portion rigid with each of said shoulders and extending away from the adjacent end of the base plate in the general direction of said tie to cooperate with the latter in presenting an opening;

blade means integrally connected with said bridging portion and extending downwardly from the end of said bridging portion which is farthest removed from said base plate, in a continuous, uninterrupted manner;

said blade means including a planar vertically oriented upper blade portion integral with said bridging portion, a planar vertically oriented intermediate blade portion extending below said upper blade portion and having a lateral dimension less than that of said upper blade portion, and a planar lower blade portion having a greater lateral dimension than said intermediate blade portion, said lower blade portion presenting a pair of opposed anchoring edges facing generally upwardly and outwardly on opposite sides thereof.

3,957,202
NOVELTY DRINKING STRAW

James R. Hornsby, Jr., 6239 Edgewater Drive, Orlando, Fla. 32810

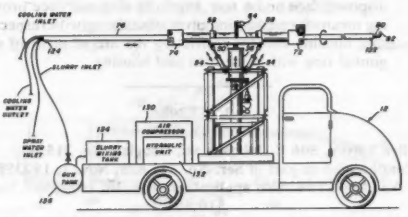
Filed Sept. 17, 1975, Ser. No. 614,310
Int. Cl.² A47G 21/18
U.S. Cl. 239—33 7 Claims

1. A novelty drinking straw comprising:
an elongated tubular member having a central bore extending therethrough,
said tubular member having an exterior surface;
a layer of liquid crystalline material disposed upon at least a portion of said exterior surface; and
a transparent membrane covering said liquid crystalline layer to prevent said layer from contacting a liquid in which said member is immersed for the purpose of orally drawing said liquid through said bore.

3,957,203
MOBILE REFRACTORY GUNNING DEVICE

Haran W. Bullard, Mountain Brook, Ala., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 491,079, July 23, 1974, abandoned.
This application Apr. 18, 1975, Ser. No. 569,631
Int. Cl.² B05B 13/06, 16/08; B05C 7/02
U.S. Cl. 239—128 8 Claims

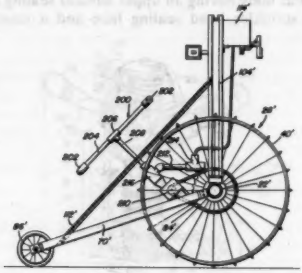


1. Gunning apparatus comprising:
a. a base;
b. a boom support frame vertically spaced from said base;
c. gunning boom means operatively mounted in said boom support frame;
d. an upstanding mast interconnecting said boom support frame and said base including:
i. vertically extendable and retractable fluid motor means mounted on said base and being generaly upstanding therefrom; and
ii. an elongated cylindrical sleeve having an upper end in engagement with said boom support, said sleeve concentrically enclosing said fluid motor means and being connected thereto for vertical movement in response to the extension or retraction thereof; and
iii. means for rotating said boom support frame with respect to said sleeve.

3,957,204
PIVOT SPRINKLER

Howard R. Farris, P.O. Box 1001, 280 Island Ave., Apt. 1502, Reno, Nev. 89501, and Calmer J. Johnson, P.O. Box 748, Mason Road & Highway 3 S., Yerington, Nev. 89447

Filed Jan. 27, 1975, Ser. No. 544,657
Int. Cl.² B05B 3/00
U.S. Cl. 239—177 16 Claims



1. A pivot sprinkler comprising an elongate irrigation pipe having sprinkler means thereon at spaced intervals, wheeled tower units supporting the pipe at spaced intervals and a standpipe at one end of the irrigation pipe for supplying water under pressure to the irrigation pipe and defining a generally vertical axis about which the irrigation pipe rotates in a circular path for discharging water onto a predetermined land area, each of said wheeled tower units comprising an enlarged wheel having a central hub, said irrigation pipe extending through the central hub with the hub and wheel being journaled on the irrigation pipe, said standpipe including a vertically disposed supply pipe, said irrigation pipe having an elbow at the end thereof and a depending pipe rigid therewith, a short pipe section sealingly and flexibly connected to the supply pipe and the depending pipe, a sleeve journaling the depending pipe, supporting legs connected to the sleeve for supporting the sleeve rotatably thereby supporting the elbow and irrigation pipe for rotational movement.

14. In an irrigation system of the type including a pipe movable in a circular path, a standpipe communicated with and supporting one end of the pipe, said standpipe including a rigid generally vertically disposed supply pipe, a short section of pipe telescopically associated with the supply pipe and sealed thereto by an O-ring seal, a vertically disposed pipe rigid with the irrigation pipe telescoped with respect to the short section of pipe and sealed thereto by an O-ring seal, sleeve means rigidly supported and disposed in encircling relation to the vertical pipe rigid with the irrigation pipe for journaling the vertical pipe with the O-ring seals enabling some degree of flexibility between the vertical pipe rigid with the irrigation pipe and the supply pipe.

3,957,205
SPRINKLER

Robert B. Costa, 5102 N. Greer Ave., Covina, Calif. 91722

Filed Feb. 20, 1975, Ser. No. 551,243
Int. Cl.² B05B 3/14; F16L 27/00
U.S. Cl. 239—230 18 Claims

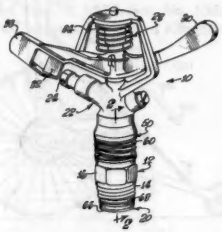
1. In a sprinkler assembly including a bearing sleeve having normally upper and lower ends, a tubular spindle containing a longitudinal water passage rotatable in said bearing sleeve and forming with said sleeve an intervening annular clearance space, lower coacting sealing and thrust bearing means on the lower ends of said bearing sleeve and spindle for sealing the lower end of said clearance space and limiting upward endwise displacement of said spindle relative to said bearing sleeve, a sprinkler head on the upper end of said spindle having a water discharge orifice communicating with said

spindle passage, and means for driving said sprinkler head and spindle in rotation relative to said bearing sleeve, improved upper sealing means for sealing the upper end of said clearance space, comprising:

a coaxial cyindrical sealing surface on the upper end of said bearing sleeve,

a coaxial, downwardly facing annular sealing face on the lower end of said sprinkler head,

a seal ring surrounding said sealing surface including an annular body having an upper annular sealing face facing said sprinkler head sealing face and a relatively thin-



walled annular flexible sealing and wiping lip about the inner perimeter of and depending downwardly from said body in surrounding relation to said sealing surface, the lower end of said lip being disposed in yieldable wiping and sealing contact with said sealing surface and said seal ring being spaced from said sealing surface at all points except said lower lip end, and

a compression spring surrounding said bearing sleeve and lip and seating downwardly against a shoulder on said bearing sleeve and upwardly against said seal ring body for yieldably retaining said sealing faces in seating contact.

3,957,206

EXTENDABLE ROCKET MOTOR EXHAUST NOZZLE

Jerry N. Mason, Redlands, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 27, 1975, Ser. No. 544,456

Int. Cl.² F02K *1/24, 9/00*

U.S. Cl. 239—265.33 **2 Claims**

1. In an extendable exhaust nozzle for a rocket engine comprising a thin, ductile, heat resistant sheet metal member suitably configurated to form a deformable nozzle structure having interior and exterior surfaces with one end thereof having a smaller portion, and adapted to be permanently affixed to the exit port of a rocket motor, the improvement which comprises a deformable, metal alloy coating on said interior surface of said deformable nozzle structure, said metal alloy having a compositional content consisting essentially of about 54 to 56 percent by weight nickel with the balance substantially all titanium and being characterized by its ability to revert to its original shape subsequent to being deformed.

3,957,207

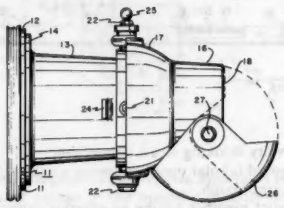
GIMBALL NOZZLE-TRIM

Bill M. Chronic, 707 N. 27th St., Boise, Idaho 83702

Filed Aug. 5, 1974, Ser. No. 492,554

Int. Cl.² B63H *11/00*

U.S. Cl. 239—265.35 **5 Claims**



1. A gimbal ring nozzle-trim, comprising:

a substantially cylindrical forward-control housing mounted at and in alignment with the discharge orifice of a marine jet propulsion apparatus, said control housing having a frustral-orbicularly configured gasket-race flange projecting from the exterior cylindrical walls rearward most terminal end of the exterior cylindrical walls;

an annular gimbal ring mounted to the exterior cylindrical walls of the housing by pins disposed along the horizontal plane cutting said trim and said housing distally forward of said gasket-race flange; and

a nozzle having a hollow semi-orbicular portion which overrides said gasket-race flange, having a substantial portion issuing rearwardly from said orbicular portion to the exterior circumferential face of said gimbal ring by pins disposed through the nozzle in the gimbal ring along the plane cutting said housing and said gimbal ring, the apparatus of claim **1** wherein, the interior circumferential edge of said gimbal ring is machined into a forward angularly disposed face and a rear angularly disposed face providing means for permitting pivot of said ring with respect to said housing and for restricting the arc of pivot of said gimbal ring with respect to said housing.

3,957,208

SPRAY GUN

Allen Spivey, 506 E. Johnson St., Douglas, Ga. 31533

Continuation-in-part of Ser. No. 411,828, Nov. 1, 1973, Pat. No. 3,840,184. This application Sept. 30, 1974, Ser. No. 510,604

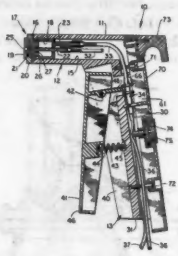
The portion of the term of this patent subsequent to Oct. 8, 1991, has been disclaimed.

Int. Cl.² B05B *7/04*

U.S. Cl. 239—372 **4 Claims**

1. A spray gun assembly comprising a body including a barrel and a handle extending at an angle from said barrel, said barrel and handle defining a passage extending in said barrel from its end opposite to said handle and in said handle to its end opposite to said barrel, a nozzle mounted in the passage of said barrel, first and second conduit means each connected at one of its ends to said nozzle and extending through the passage of said barrel and said handle, first and second needle valve means mounted in said first and second conduit means respectively and arranged to selectively open and close said first and second conduit means, each of said needle valve means comprising a socket defining a bore and a needle member movable along its length in a direction into said socket to close the needle valve means and in a direction out of said socket to open the needle valve means, a trigger member pivotally connected at one of its ends to said body with its other end movable toward and away from said handle,

spring means arranged to bias said trigger member away from said handle, said trigger member including valve engaging means connected to both of said first and second needle valve means and arranged to move the needle member of each needle valve means out of its socket as the trigger member is moved against the bias of its spring means toward the handle to open said needle valve means and to move the needle

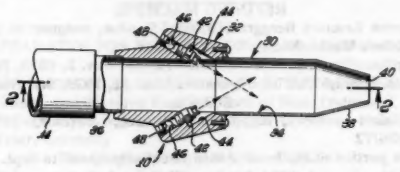


member of each needle valve means into its socket as the trigger member is moved with the bias of its spring means away from the handle to close said needle valve means, said valve engaging means comprising a projection having a stepped configuration so as to open said first needle valve means before opening said second needle valve means, and to close said second needle valve means before the closing of said first needle valve means.

3,957,209
METHOD AND APPARATUS FOR SPRAYING INSULATING COATING

Gary F. Thomson, Corona del Mar, Calif., assignor to Therma-Coustics Manufacturing, Inc., Colton, Calif.

Filed Jan. 30, 1975, Ser. No. 545,413
Int. Cl.² B05B 7/08; B05D 5/00
U.S. Cl. 239—429 **3 Claims**



1. In a spraying apparatus for mixing a flowable dry fibrous material with a liquid, the combination of:

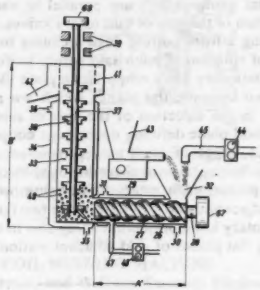
a. a discharge nozzle provided with wall means defining a substantially uniform diameter passage means for the dry material having an inlet end, and having an outlet end portion convergent in the downstream direction; and

b. at least two circumferentially spaced, liquid spray nozzles carried by said wall means within said passage means at locations on different sides thereof and having means for directing fan-shaped sprays of the liquid laterally of said passage means and toward the downstream end of said passage means towards said outlet end thereof, the liquid sprays from said spay nozzles being so directed as to fan laterally of said passage means and to tend to intersect within said passage means entirely within a region upstream from said outlet end portion thereof, whereby to thoroughly and substantially uniformly wet the dry material flowing through said passage means.

3,957,210
STIRRING MILL

Herbert Dürr, Mannheim, Germany, assignor to Draiswerke GmbH, Mannheim, Germany

Filed Aug. 9, 1974, Ser. No. 496,164
Claims priority, application Germany, Aug. 11, 1973, 2340726; July 9, 1974, 2432860
Int. Cl.² B02C 23/36
U.S. Cl. 241—46.02 **8 Claims**



1. A stirrer mill for the continuous dispersion and fine grinding of substances which tend to briquette or agglomerate in a liquefiable dispersion medium, comprising:

grinding means including a cylindrical vessel, a stirrer shaft within said vessel and coaxial therewith, mixing tools disposed on said stirrer shaft, grinding elements disposed and retained within said vessel, and means for driving said shaft;

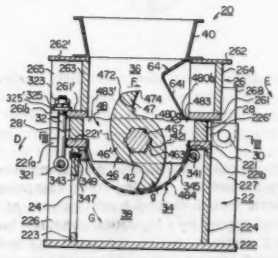
mixing means immediately preceding and directly feeding into said grinding means, said mixing means consisting essentially of a cylindrical chamber, a mixing worm disposed coaxially within said cylinder chamber, and means for driving said worm; and

metering means, immediately preceding and feeding directly into said mixing means, for dispensing metered quantities of substances and dispersion medium into said mixing means.

3,957,211
REFUSE DISINTEGRATION DEVICE

Minoru Nakamura, Amagasaki, and Hisashi Ikegi, Suita, both of Japan, assignors to Osaka Kiko Co., Ltd., Tokyo, Japan

Filed Jan. 15, 1975, Ser. No. 541,217
Claims priority, application Japan, Jan. 24, 1974, 49-10818
Int. Cl.² B02C 13/06
U.S. Cl. 241—73 **3 Claims**



1. A refuse disintegration device comprising,

a casing having a chamber therein,

inlet means communicated with said chamber for introducing refuse which should be disintegrated,

at least one rotatable shaft extending through said chamber, said shaft being connected to drive means to rotate said shaft,

a set of spaced apart rotary knives fixably mounted on said shaft in said chamber,

a set of stationary knives arranged in said chamber being fixably mounted to said casing at both ends thereof, said rotary knives and said stationary knives being alternately arranged to each other;

the improvement wherein each said rotary knife comprises a main body and at least one projection having two opposite flat planes which are parallel to each other in the direction of the axis of said rotary knives, each said plane defining a front cutting edge inclining toward the direction of rotation of each said rotary knife, whereas each said stationary knife comprises a plate like member having two opposite flat planes which are parallel to each other in the direction of the axis of said rotary knives, each said plane defining upper edge cooperable with one of said edges of each said projection, said stationary knives having a bore therethrough, through which said shaft passes; each rotary knife being rotatable between two adjacent stationary knives, the two flat planes of each said rotary knife projection being also in contact with the facing flat planes of said adjacent stationary knives.

3,957,212
ROLL CRUSHING MILL

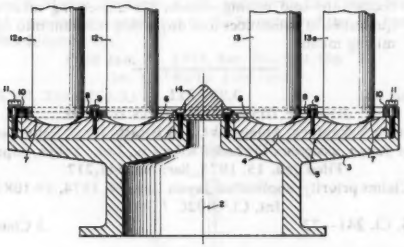
Ludger Lohnherr, Diestedde, Germany, assignor to Polysius AG, Neubeckum, Germany

Filed Feb. 18, 1975, Ser. No. 550,863

Claims priority, application Germany, Feb. 25, 1974, 7406586[U]

Int. Cl.² B02C *15/00*

U.S. Cl. 241—110 **10 Claims**



1. A vertical axis roll crushing mill comprising a grinding plate having an annular grinding track composed of at least two concentric trough-shaped track sections at substantially the same level spaced by a transition zone; roll bodies rollable in said track sections; means for delivering material to the innermost track section; adjustable height barrier ring means interposed between each of said track sections at said transition zone; and means acting between said plate and said barrier ring means for securing the latter to said plate at said transition zone.

3,957,213
GYRATORY CRUSHER WITH MATERIAL DISTRIBUTION MEANS

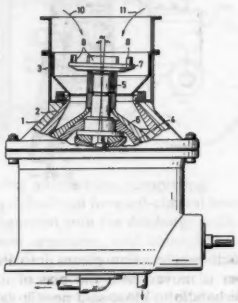
Helmut Stöckman, Birkenstr. 24, 5047 Wesseling; Klaus Schütte, Hans-Schulten-Str. 10, 5 Cologne 91, and Heinz Hürtmanns, Spechlstr. 21, 5 Cologne 60, all of Germany

Continuation of Ser. No. 395,845, Sept. 10, 1973, abandoned. This application Mar. 31, 1975, Ser. No. 565,727

Claims priority, application Germany, Sept. 16, 1972, 2245580

Int. Cl.² B02C *2/04*

U.S. Cl. 241—202 **5 Claims**



1. A gyratory crusher, comprising:

a housing having a top supply conduit for material to be crushed and at a lower level an interior crusher lining in position for crushing coaction with a crusher cone which is mounted for rotary and wobbling motion within said housing and has secured to its top surface a material distributing disc of substantial thickness located within said top supply conduit and having a plane top surface with upwardly projecting material guiding means comprising individual upstanding elements of a height at least as great as the thickness of the disc;

3,957,214
REFINING MACHINE

Torsten Lennart Berggren, Nassjo, Sweden, assignor to AB Krima Maskinfabrik, Nassjo, Sweden

Continuation-in-part of Ser. No. 412,464, Nov. 2, 1973, Pat. No. 3,902,673. This application Mar. 31, 1975, Ser. No. 563,676

Claims priority, application Sweden, Nov. 7, 1972, 14386/72

The portion of the term of this patent subsequent to Sept. 2, 1992, has been disclaimed.

Int. Cl.² B02C *7/08*

U.S. Cl. 241—246 **2 Claims**

1. A refining machine for fragmented beating material such as wood chippings, shavings and the like as well as for paper pulp in higher, non-pumpable concentrations, comprising:

a central body;

an outer part surrounding said body, said central body and said outer part being rotatable in relation to each other about an axis of rotation, said central body and said outer part being spaced from each other so that a rotationally symmetric, annular infeed channel is formed between said central body and said outer part, said infeed channel feeding beating material over at least a portion thereof generally in the direction of said axis of rotation and having, in the feed direction of said feeding material, gradually increasing inner and outer diameters, respectively;

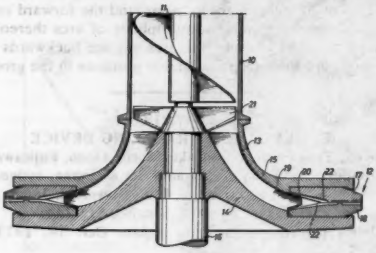
beating means including first and second annular parts which are respectively supported on said central body

and said outer part, said beating means being arranged to be passed by the beating material after said beating material is passed through said infeed channel;

the improvement wherein:

said infeed channel is shaped to redirect movement of said beating material from a generally axial movement to a movement essentially radially outwards in relation to the axis of rotation of said beating means;

the generatrices to the two opposing limiting surfaces of said infeed channel have a uniform, continuous curvature along their entire length, and further have a successively decreasing inclination out towards said beating means, said inclination being in relation to said beating means;



said opposing limiting surfaces of said infeed channel converge in the direction out towards said beating means, and are shaped such that the total flow area of said infeed channel increases continuously in a direction out towards said beating means;

the limiting surfaces of said infeed channel stagelessly pass outwardly into said beating means; and

means is provided to divide said infeed channel into a plurality of generally spiral-shaped flow channels, said dividing means including spiral-shaped vanes mounted on one of said limiting surfaces of said infeed channel which is arranged to rotate, said spiral-shaped vanes protruding into said infeed channel and which extend substantially up to the opposite limiting surface, thereby dividing said infeed channel into said spiral-shaped flow channels.

3,957,215
APPARATUS FOR COMMINUTING AND MIXING OF FOODSTUFFS

Friedrich Otto, Hameln; Heinrich Tilch, Rinteln; Friedrich Köllner, and Manfred Rogalski, both of Hess- Oldendorf, all of Germany, assignors to A. Stephan u. Sohne, Hameln, Weser, Germany

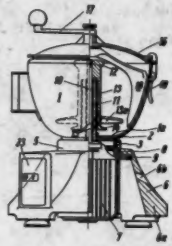
Filed Sept. 9, 1974, Ser. No. 504,665

Claims priority, application Germany, July 5, 1974, 2432289

Int. Cl.² B02C *18/18, 18/18*

U.S. Cl. 241—282.1 **6 Claims**

1. In an apparatus for comminuting and mixing of foodstuffs, a combination comprising a stationary bowl having a bottom wall and an upstanding circumferential wall; a motor mounted beneath said bowl and having an upright output shaft which extends through said bottom wall and projects upwardly within said bowl, said output shaft having an upper end portion; a first tubular member freely surrounding said output shaft within said bowl and having a first upper open end at a level below said upper end portion, and a lower end which is sealingly connected with said bottom wall; a second tubular member freely surrounding said first tubular member out of contact therewith and having a second upper end connected with said upper end portion of said shaft for joint rotation therewith, and a second open lower end at a level below said first upper open end; and transversely projecting tool portions on said second tubular member, said first and second tubular members having an outer and an inner circumferential surface, respectively, which define with one another an annular gap, at least one of said surfaces being formed with spiral



converging grooves configurated for converging any material entering said gap in direction towards said bottom wall so that said material cannot rise upwardly in said gap.

3,957,216
COIL WINDING MACHINE

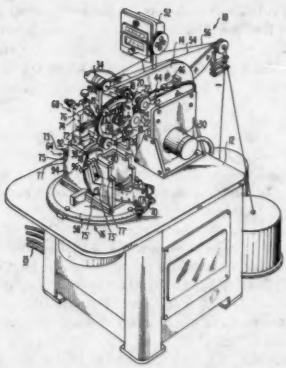
Horst Eugen Haslau, and William Emerson Rigsbee, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 278,351, Aug. 7, 1972, abandoned. This application Sept. 6, 1974, Ser. No. 503,682

Claims priority, application United Kingdom, Feb. 22, 1972, 8214/72

Int. Cl.² B65H *81/02*

U.S. Cl. 242—4 C **1 Claim**



1. In a television deflection yoke coil winding machine of the type having a base, indexing means rotatably mounted on the base, an upright support mounted on the base and coil winding means extending from said upright support overhanging said indexing means, said base, support and coil winding means being secured in fixed relationship, said indexing means rotating beneath said coil winding means and adjacent said support, the improvement comprising:

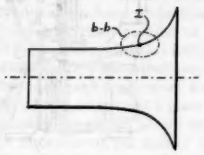
a plurality of television yoke core clamping means pivotally mounted on said indexing means,

said clamping means each including means for positioning the clamping means either in an upright coil winding position or an idle prone position for passing without interference between said coil winding means, support and said base.

3,957,217
STORAGE DRUM FOR INTERMEDIATE YARN FEEDING DEVICE

Robert W. Clemens, Malverne, N.Y., assignor to Wesco Industries Corporation, Plainview, N.Y.

Filed June 25, 1975, Ser. No. 590,303
Int. Cl.² B65H *51/20*
U.S. Cl. 242—47.01 **4 Claims**

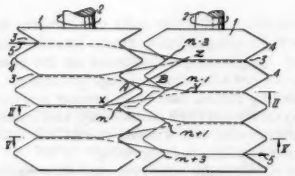


1. A storage drum adapted to have yarn wound thereon tangentially adjacent the rear end thereof for forming thereon a plurality of windings which advance axially toward the forward end thereof comprising, a surface of revolution about the longitudinal axis of the drum, said surface having a yarn loading section and a yarn winding accumulating section joined together at a point of inflection, said yarn loading section extending rearwardly of said point of inflection and said yarn accumulating section extending forwardly of said point of inflection, said loading section being shaped so that a tangent thereto immediately rearwardly of the point of inflection forms an angle with the drum axis whose tangent is greater than the coefficient of static friction between yarn and drum surface and so that tangents to progressively more rearward points along said loading section form progressively larger angles with the drum axis, said accumulating section being shaped so that a tangent thereto immediately forwardly of the point of inflection forms an angle with the drum axis whose tangent is less than the coefficient of dynamic friction between yarn and drum surface and so that tangents to progressively more forward points along the accumulating section form progressively smaller angles with the drum axis.

3,957,218
SELF THREADABLE GROOVED ROLLERS

Robert Reid Coats, and John Michael Greenway, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 509,636, Sept. 26, 1974, abandoned, which is a division of Ser. No. 415,121, Nov. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 123,703, March 12, 1971, abandoned. This application July 29, 1975, Ser. No. 600,057
Claims priority, application United Kingdom, Mar. 19, 1970, 13357/70
Int. Cl.² B65H *51/20*
U.S. Cl. 242—47.03 **8 Claims**

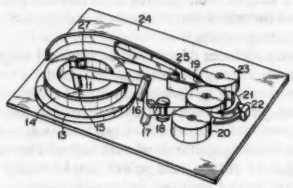


1. In a method of loading a strand on to a storage device comprising two rolls each mounted on an axis cantilevered forward from a rearward bearing, and each having a curved surface comprising parallel circumferential grooves separated by ridges or lands, and the rolls being mounted so that a strand may be passed round a series of successive arcs of contact in grooves alternately in one roll and the other so that the first and subsequent odd numbered grooves in the series are in one roll and the second and subsequent even numbered grooves in the series are in the other roll; the improvement comprising closely spacing the rolls so that their separation is that at which all the transverse common tangents from a groove in one roll which is number n in the series to the grooves in the other roll intersect ridges or lands except those transverse common tangents from the groove n to grooves number $n \pm m$ in the series where n is any number in the series and m has any of the values 1, 1 and 3 and 1, 3 and 5, leading the strand from a delivery means to a groove, threading the strand in a plurality of figure of eight loops around the forward ends of the rolls thereby forming a multiplicity of arcs thereon and rotating the rolls whereby the arcs migrate backwards along the rolls until they drop into stable positions in the grooves.

3,957,219
ENDLESS TAPE TRAVELING DEVICE

Hiroyuki Tsukamoto, Kawasaki; Morio Akino, Fujisawa, and Yoshihiro Kusanagi, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 9, 1974, Ser. No. 513,234
Claims priority, application Japan, Oct. 18, 1973, 48-117299
Int. Cl.² B65H *17/48*
U.S. Cl. 242—55.19 A **9 Claims**



1. An endless tape traveling device comprising:
a substrate;
a stationary reel mounted on the substrate and having an annular body around which an endless tape roll is wound, and communicating means formed in the annular body to communicate the outer peripheral surface of the annular body to the inner peripheral surface thereof;
a guide member mounted on the substrate within the interior of the annular body; and
driving means for driving the endless tape such that an air film is formed between the innermost periphery of the tape roll and said outer peripheral surface of said annular body and the endless tape wound around the annular body is delivered from the innermost periphery of the tape roll, through the communicating means to the guide member, and taken up around the outer periphery of the tape roll.

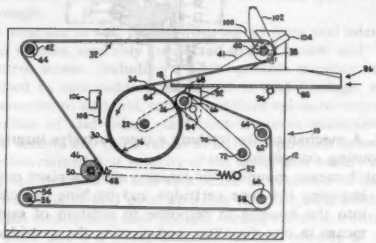
3,957,220
SHEET MATERIAL RECEIVING AND STORING APPARATUS

Christian A. Beck, Ridgefield, and Robert L. Wardwell, Glenbrook, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Nov. 18, 1974, Ser. No. 524,453
Int. Cl.² B65H *17/02*
U.S. Cl. 242—67.3 R **3 Claims**

1. Apparatus for receiving and storing flat sheet material in rolled configuration comprising:

a. a winding spool having a peripheral surface for receiving and winding flat sheet material thereon;
b. support means;
c. means carried by said support means for rotatably and removably supporting said winding spool in a fixed position relative to said support means;
d. a plurality of endless belts carried by said support means in spaced parallel relation axially of said winding spool;
e. means mounting said belts on said support means in a closed loop path in which each of said belts has
1. a first portion extending around a major portion of said peripheral surface of said winding spool and being in frictional driving contact therewith, and



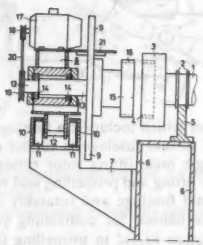
2. a second portion which is disposed away from said peripheral surface of said winding spool to form junctures with said first portion, said belts forming a converging entrance nip with the peripheral surface of said winding spool in the vicinity of one of said junctures of said first and second belt portions for receiving flat sheet material in said nip, and
f. means for concurrently driving said belts and rotating said winding spool in a direction to draw sheet material into said nip and cause said sheet material to be wound upon said peripheral surface of said winding spool.

3,957,221

DEVICES FOR BRAKING SHEET-MATERIAL REELERS

Jaakko Palovaara, Jyvaskyla, Finland, assignor to Valmet Oy, Helsinki, Finland

Filed Apr. 1, 1975, Ser. No. 563,960
Claims priority, application Finland, Apr. 2, 1974, 1004/74
Int. Cl.² B65H *17/44*
U.S. Cl. 242—99 **10 Claims**



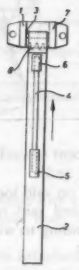
1. In a machine having an elongated rotary means onto which a sheet material, such as paper, cardboard, or the like, is reeled while said rotary means rotates about its axis, said rotary means having one end which extends across said axis, carriage means situated along said axis adjacent but beyond said one end of said rotary means, support means supporting said carriage means and said rotary means for free movement along a pair of parallel paths, respectively, which are perpendicular to said axis so that said carriage means can move along one of said paths to remain along said axis adjacent said end of said rotary means while the latter moves along the other of said paths during increase in the diameter of the sheet material reeled onto said rotary means, and braking means for braking the rotation of said rotary means, said braking means having one part fixed to said end of said rotary means while the remainder of said braking means is carried by said carriage means for cooperating with said one part of said braking means for braking the rotation of said rotary means after sheet material has been reeled thereon to a given extent.

3,957,222

SAFETY BELTS OF WIND-UP TYPE FOR VEHICLES

Carl Rutger Bladh, Krusbarsvagen 5, Vilsharad, S-305-90 Halmstad, Sweden

Filed Jan. 15, 1975, Ser. No. 541,084
Claims priority, application Sweden, Jan. 21, 1974, 7400727
Int. Cl.² B65H *75/48*
U.S. Cl. 242—107 **6 Claims**



1. A safety belt of wind-up type for a vehicle, comprising a shaft rotatably mounted in a casing, a spiral spring member connected with said shaft, a strap adapted normally to be wound up about said shaft by said spring member, said spiral spring member being disposed to be tightened by unwinding said strap from said shaft during movement of said strap to its position of use, and characterized by a spring element arranged along said strap, said spring element having such shape and such position relative to the strap that when the strap has been drawn out into the region for its position of use, said spring element is unwound from the shaft and thereby produces a force counterdirected to the force emanating from the spiral spring member, thus reducing the force exerted on said strap by said spring member.

3,957,223

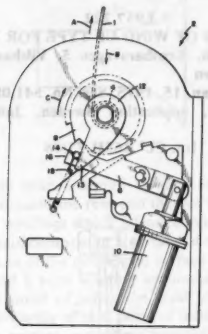
LIMITER FOR VEHICLE SAFETY BELT TENSION-RELIEVING APPARATUS

Arduino Colasanti, East Detroit; Lawrence Robert Kiehart, Mount Clemens, and Dornis L. Levasseur, Warren, all of Mich., assignors to Allied Chemical Corporation, New York, N.Y.

Filed May 12, 1975, Ser. No. 576,825
Int. Cl.² A62B *35/00;* **B65H** *75/48*
U.S. Cl. 242—107.6 **6 Claims**

1. In a vehicle safety belt system adapted to restrain an occupant in a vehicle seat, the safety belt system including a shoulder belt; a retractor having a rewind mechanism biased to rewind the shoulder belt on a reel shaft of the retractor; and a tension-relieving apparatus for relieving tension on the shoulder belt produced by the rewind mechanism of the retractor; said shoulder belt tension-relieving apparatus including: a tension-relieving locking member disposed on said retractor, said locking member having a locking position and an unlocking position, said locking member in its locking

position preventing operation of the rewind mechanism, thereby preventing further rewinding of the shoulder belt into the retractor; a tension-relieving wheel mounted on the reel shaft of the retractor for engagement by said locking member; an actuating means for actuating said locking member to its locking position and thereby relieving the tension on said shoulder belt produced by the rewind mechanism of the retractor; the improvement comprising:



a cam mounted adjacent to said tension-relieving wheel for rotation therewith; and

stop means mounted on said locking member to limit rotation of said cam and said reel shaft in the unwinding direction corresponding to withdrawal of said safety belt from said retractor.

3,957,224

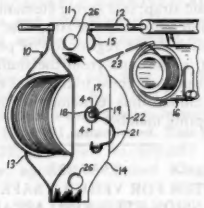
REEL-IN SPOOLED FISHLINE DISPENSER

Pete Hugh Smith, P.O. Box 403, Dora, Ala. 35062

Filed Jan. 7, 1975, Ser. No. 539,055

Int. Cl.² A01K *87/00*; **B65H** *49/00*

U.S. Cl. 242—129.6 **5 Claims**



1. In a holder for supporting a spool of line from a rod as line is transferred from the spool to a fishing reel carried by said rod,

a. an elongated flexible webbing of a length to be folded on itself about said rod and provide depending side portions,

b. horizontally aligned openings through said side portions,

c. a spool supporting pin extending through said openings and disposed to support a spool of line between said side portions with said side portions engaging the sides of said spool and extending below said spool,

d. detachable means connecting said side portions of said webbing to each other intermediate said spool and said rod, and

e. detachable means connecting said side portions of said webbing to each other beneath said spool.

3,957,225

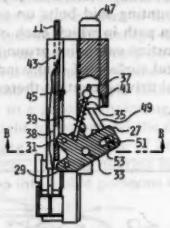
CARTRIDGE LATCHING MECHANISM

Gregory Gene Vogel, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 5, 1975, Ser. No. 574,680

Int. Cl.² G03B *1/04*; **G11B** *15/32, 23/04*

U.S. Cl. 242—198 **5 Claims**



1. A mechanism for latching a tape cartridge inserted into a housing, comprising:

latch means mounted for rotation about a pivot point, for engaging the tape cartridge and latching the cartridge into the housing in response to rotation of said latch means in one direction, and ejecting the cartridge from the housing in response to rotation of said latch means in another direction opposite said one direction; and

spring means mounted in spatial relation with said latch means for exerting spring forces on said latch means to produce a torque thereon in said one direction when an axis of said spring means is aligned on one side of said pivot point to positively engage the cartridge and position it in the housing, and a torque in said other direction when said axis is aligned on an opposite side of said pivot point to positively eject the cartridge from the housing.

3,957,226

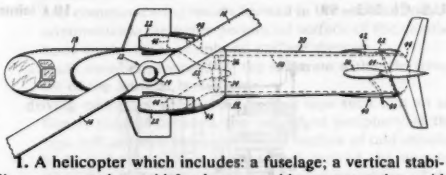
HELICOPTER YAW AND PROPULSION MECHANISM

Myron L. Daggett, Jr., Broomall, and Leon L. Douglas, Wynnewood, both of Pa., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 27, 1975, Ser. No. 544,077

Int. Cl.² B64C *27/82*

U.S. Cl. 244—17.19 **7 Claims**



1. A helicopter which includes: a fuselage; a vertical stabilizer connected to said fuselage; a rudder connected to said stabilizer; a single main lifting rotor rotatably connected to said fuselage for lifting and propelling said helicopter; a motor connected to said fuselage and rotatably connected to said rotor; and a mechanism for controlling yaw and providing thrust augmentation to aid in propelling the helicopter forward which comprises:

an air inlet in said fuselage;

a duct positioned in said fuselage, connected at one end thereof to said inlet so that air may pass through said inlet to said duct;

a first nozzle positioned in the rear portion of said fuselage, connected to said duct so air may pass from said duct and exit through said first nozzle generating a force which acts in a first direction tending to counteract torque generated when said motor drives said rotor;

a second nozzle positioned in the rear portion of said fuselage on the side thereof opposite said first nozzle con-

nected to said duct so air may pass from said duct and exit through said second nozzle thereby generating a force which acts in a second direction opposite said first direction;

a third nozzle positioned in the rear portion of said fuselage connected to said duct so air may pass from said duct and exit through said thrid nozzle generating a force which acts in a third direction tending to propel said aircraft forward;

a first valve mounted in said first nozzle for controlling the volume of air which may pass there through;

a second valve mounted in said second nozzle for controlling the volume of air which may pass there through;

a third valve pivotally mounted in said third nozzle for controlling the volume of air which may pass there through;

a fan mounted in said duct for driving air from said inlet to said nozzles, operably connected to said motor; and

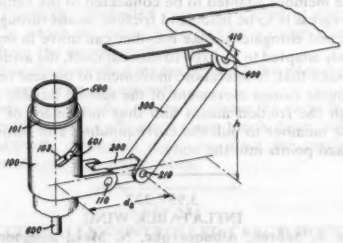
a control means, including a pilot operable member connected to said rudder, connected to said fuselage, and connected to said first, second and third valves to vary the position of said valves, said control means maintaining said second and third valves in a closed position below a predetermined first velocity of the helicopter while varying the position of said first valve in response to pilot movements of said pilot operable member, said control means maintaining said first and second valves in a closed position above a predetermined second velocity of the helicopter while maintaining said third valve in an open position, and said control means varying the position of said second valve in response to pilot movements of said pilot operable member below said first predetermined velocity in the event autorotation occurs so that the forces generated by said first nozzle and said second nozzles cooperate to control the yaw of said aircraft.

3,957,227

ROTOR PITCH CONTROL MECHANISM

Joseph M. Baskin, Bala Cynwyd, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 10, 1975, Ser. No. 548,474
Int. Cl.² B64C 27/52
U.S. Cl. 244—17.25 **4 Claims**



1. A blade pitch control mechanism for use with a rotor blade which comprises:

a. a tubular slider mounted externally concentric to a rotor shaft;

b. thrust bearings mounted at each end of said slider between said rotor shaft and said slider which allow the slider to rotate about the rotor shaft while constraining longitudinal motion of the slider along the axis of the rotor shaft;

c. actuating means to cause rotation of said slider about said rotor shaft;

d. linkage means connecting said slider to a fixed attachment on the rotor blade to transmit control forces in response to rotation of the slider to the fixed attachment to change the pitch of the rotor blade, comprising:

1. a control arm fixedly mounted on the outside of the slider;

2. a first intermediate link, hinge-mounted to the control arm on one end;

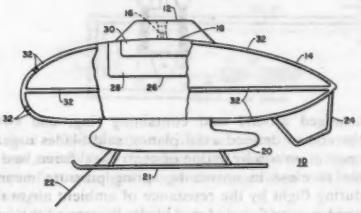
3. a second intermediate link connected on one end through a universal joint to the first intermediate link and hingedly connected on the other end to the fixed attachment on the rotor blade.

3,957,228

THERMODYNAMIC KITE

Guy H. Kennedy, Jr., 1515 Ivy Creek Circle, San Jose, Calif. 95121

Filed Feb. 10, 1975, Ser. No. 548,459
Int. Cl.² B64B 1/44, 1/62
U.S. Cl. 244—33 **9 Claims**



1. A tethered thermodynamic kite comprising:

a. a non-rigid, gas-inflatable body member, said member having a front portion;

b. a rigid housing structure attached to said body member, said rigid housing structure having a tether line attached thereto;

c. a partially non-rigid envelope containing a first gas located inside said body member;

d. means for inflating said inflatable body member with a heated second gas causing said first gas to expand, thereby increasing the buoyancy of said kite, said inflating means located within said housing structure but communicating with said body member;

e. means for increasing the rigidity of said body member, said means being attached to said body member;

f. a body member gas outlet valve having a variable orifice;

g. An aneroid barometer located in said housing structure, said aneroid barometer being preset for a specific altitude; and

h. a computer located in said housing structure communicating with said body member gas outlet valve and said aneroid barometer, said computer being programmed to receive signals from said aneroid barometer and actuate said variable orifice of said body member outlet valve, thereby maintaining said kite at a preselected altitude by controlling the amount of gas escaping from said body member.

3,957,229

CONVERTIBLE AUXILIARY TURBINE FOR AIRCRAFT

Harry C. Davis, 2 Elmwood Ave., Winchester, Mass. 01890

Continuation-in-part of Ser. No. 387,205, Aug. 9, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,354
Int. Cl.² B64D 27/16
U.S. Cl. 244—53 R **7 Claims**

1. A convertible auxiliary turbine having a common axis and a main engine structure and comprising:

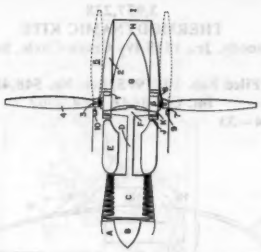
A. a free-floating rotatable exhaust chamber having generally coniform cylindrical walls extending forwardly,

B. means thrust-anchoring said walls to the perimeter of the main engine structure for rotation and support,

C. an inverted rotor having a plurality of planular, elongated drive-vanes axially aligned, radially disposed and interiorly integral with said exhaust chamber walls,

D. an exterior containing ring means and streamlined housing means therefor rigidly secured around said walls, concentric with said thrust-anchoring means,

E. a plurality of aviation propeller blades respectively mounted transverse to the turbine axis, on and uniformly



arranged around said containing ring, and swingable thereon in defined axial planes, said blades urgeable to open in unison by action of centrifugal force, and urgeable to close in unison by spring pressure means, and during flight by the resistance of ambient air to the forward moving force of said blades in concert therewith, as means preventing aerodynamic drag,

F. means locking said turbine when idle, and releasing said turbine when active.

3,957,230

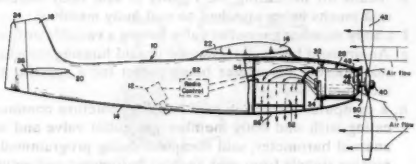
REMOTELY CONTROLLED ELECTRIC AIRPLANE

Roland A. Boucher, 5104 W. 58th Place, Los Angeles, Calif. 90062, and Robert J. Boucher, 2301 Cheryl Place, Los Angeles, Calif. 90049

Continuation of Ser. No. 383,689, July 30, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 556,674

Int. Cl.² B64D *27/24, 33/08*

U.S. Cl. 244—53 R **13 Claims**



2. The combination of

an aircraft,

an electric motor mounted on said aircraft,

an outer casing on said motor secured to said aircraft,

an armature in said motor rotatably disposed inside of said casing,

a propeller connected to said armature and driven thereby for propelling said aircraft through the atmosphere, said propeller being adapted to free-wheel when said motor is turned "OFF" and said aircraft is gliding,

a ventilation passage extending through said casing and into and around the armature,

an entrance to said passage open to the atmosphere,

an enlarged scoop on the entrance to said passage positioned behind the propeller and in the direct blast of air therefrom whereby the blast from the propeller directs a flow of air through said passage and into direct and intimate heat exchanging relation with the rotating armature, and

a battery pack on said aircraft operatively connected to said motor for supplying electrical power to drive the motor, said battery pack being disposed in said ventilation passage whereby the flow of air through the passage passes into direct and intimate heat exchanging relation with the battery pack after it has passed through the motor.

3,957,231

RESTRAINT SYSTEM

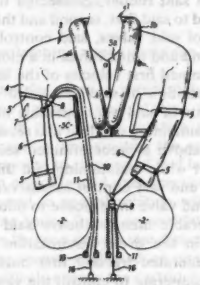
Michael Clayden Miller, 10 Moody Road, Hillhead, Fairham, Hants., and James Mitchell Hawkins, 45 Saint Albans Ave., Ashton-under-Lyne, Lancashire, both of England

Filed July 15, 1974, Ser. No. 488,669

Claims priority, application United Kingdom, July 17, 1973, 33948/73

Int. Cl.² B64D *25/02*

U.S. Cl. 244—122 AG **14 Claims**



1. An arm restraint system for use in an emergency escape operation in which an ejection seat and occupant may be ejected together comprising, for each of the occupant arms, a first elongate flexible member adapted to be connected at two fixed points to the corresponding arm, said points being on opposite sides of the elbow joint, a slidable member adapted to slide along the flexible member between said two fixed points and to connect that member to a second elongate flexible member adapted to be connected to the vehicle from which egress is to be made and friction means through which the second elongate flexible member can move in one direction only adapted to be fixed to the seat itself, the arrangement being such that, in operation, movement of the seat relative to the vehicle causes movement of the second flexible member through the friction means and thus movement of the first flexible member to pull the corresponding arm through said two fixed points into the body.

3,957,232

INFLATABLE WING

Wayne A. Sebrell, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 3, 1975, Ser. No. 546,474

Int. Cl.² B64C *3/30*

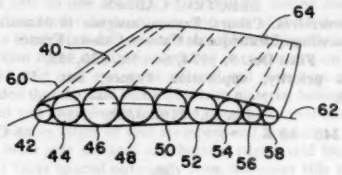
U.S. Cl. 244—123 **12 Claims**

1. An inflatable aerodynamic wing structure comprising:

an airfoil having at least two airtight inflatable tubular enclosure means made of a flexible material and extending in a spanwise direction, said enclosure means are butted lengthwise together and bonded together at their lines of contact for essentially the entire length of the enclosures providing an inner inflatable support structure and airfoil definition to the airfoil;

outer collapsible cover means forming a taut, smooth airfoil outer surface about the entire enclosure means when the

enclosure means are inflated, and bonded along the lines of contact between the cover means and the enclosure means;



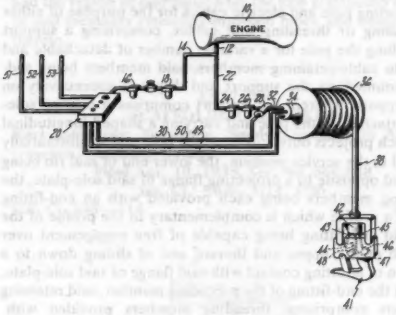
inflation means for inflating the enclosure means to form the inflatable structure.

3,957,233

FLUIDICALLY CONTROLLED CARGO HOOK CONTROLLED SYSTEM

David Orin Adams, Cape Neddick, Maine, assignor to United Technologies Corporation, Hartford, Conn.

Filed July 21, 1975, Ser. No. 597,628
Int. Cl.² B64D *9/00*
U.S. Cl. 244—137 R **9 Claims**



1. A fluidically controlled cargo hook control system for aircraft in which the cargo is carried by a cargo hook supported from the aircraft including:

A. fluidically controlled means to permit the pilot to release the cargo from the aircraft,

B. fluidically controlled means to release the cargo from the aircraft automatically upon cargo touch-down, and

C. fluidically controlled means to place the cargo hook control system in a safe mode.

3,957,234

FLUIDICALLY CONTROLLED CARGO HOOK CONTROLLED SYSTEM

William Joseph Mulvey, Hamden, Conn.; David Orin Adams, Cape Neddick, Maine, and Arthur Lawrence Sivigny, Bridgeport, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed July 21, 1975, Ser. No. 597,629
Int. Cl.² B64D *9/00*
U.S. Cl. 244—137 R **24 Claims**

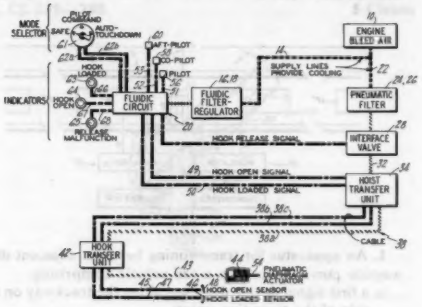
1. A fluidically controlled cargo hook control system for aircraft in which the cargo is carried by a cargo hook supported from the aircraft including:

A. fluidically controlled means to permit the pilot to release the cargo from the aircraft having:

1. a first or/nor fluid switch actuatable to be inoperative or operative so that its fluid output is directed to release the cargo from the aircraft,

2. a second fluidic or/nor switch actuatable to be inoperative or operative to actuate the first or/nor switch to its operative condition, and

3. at least one pilot operable fluidic back pressure switch operable so that its fluid input is normally vented to disarm the back pressure switch and so as to be pilot actuatable to actuate the back pressure switch to produce a fluidic output which serves to actuate the second switch to its operative condition to thereby actuate said first switch to its operative condition to release the cargo,



B. fluidically controlled means to release the cargo from the aircraft automatically upon cargo touch-down, and

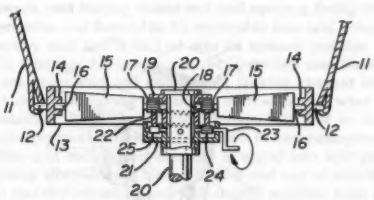
C. fluidically controlled means to place the cargo hook control system in a safe mode.

3,957,235

ROTATING PARACHUTE

Armando P. Centofanti, 2812 Newbern Circle, Youngstown, Ohio 44502

Continuation-in-part of Ser. No. 472,895, May 23, 1974, abandoned. This application July 21, 1975, Ser. No. 597,897
Int. Cl.² B64D *17/34*
U.S. Cl. 244—152 **4 Claims**



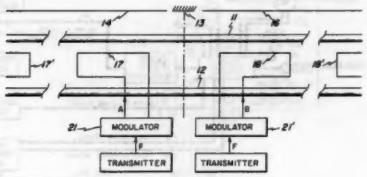
1. A rotary parachute comprising the combination of a canopy having a set of shroud lines connected at their upper ends with the peripheral edge of the canopy and a device attached to the lower ends of said shroud lines for imparting rotary motion to said shroud lines and canopy, said device comprising an annular frame, a central hub and a plurality of shafts rotatably positioned radially therebetween, fan blades on said shafts so as to rotate said device by air passing upwardly therethrough when said parachute is descending, means on said annular frame and central hub journaling said shafts, gears on said shafts and means for simultaneously rotating said gears and shafts so as to change the pitch of said fan blades and the speed of rotation of said device, the lower ends of said shroud lines being attached to said annular frame and means carried by said central hub of said device for supporting an article to be carried thereby in non-rotative depending relation thereto.

3,957,236

METHOD AND APPARATUS FOR TRANSITIONING DIVERSE POWER SOURCES TO RAIL VEHICLES

David Reeves Phelps, Alexandria, Va., and Paul Thomas Ryan, Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Sept. 25, 1974, Ser. No. 509,125
Int. Cl.[2] B61L 3/12
U.S. Cl. 246—187 B 14 Claims



1. An apparatus for transitioning between adjacent diverse wayside power sources to a rail vehicle comprising:

a. a first signal device disposed along the trackway on a first side of the transition point;

b. a second signal device disposed along the trackway on the second side of the transition point; and

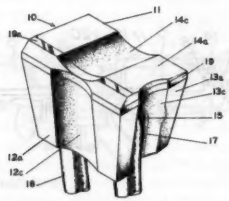
c. a receiver disposed on the vehicle such that when the vehicle passes from said first side to said second side it is sequentially responsive to said first and second signal devices for disconnecting from the vehicle the wayside power source on said first side, changing a power switch on board the vehicle from the first side source position to a second side source position, and connecting to the vehicle the wayside power source on said second side of said transition point.

3,957,237

CHOCKS

Gaylord K. Campbell, 5113 St. Cyr, Middleton, Wis. 53562

Filed May 17, 1974, Ser. No. 470,948
Int. Cl.[2] A47G 29/00
U.S. Cl. 248—1 15 Claims



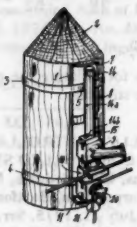
1. A mountaineering chock comprising: a rigid body having an aperture for accommodating a runner, a bottom surface, said runner aperture opening on said bottom surface, at least one pair of opposed external working surfaces tapering towards said bottom surface for engaging a rock formation, and at least one non-superficial concave surface portion formed in the lateral midsection of at least one of said opposed working surfaces for saddling a rock formation, said non-superficial concave surface portion being distinct from said runner aperture, the general centerline of said non-superficial concave surface portion having a substantially upright orientation in the direction of the taper of the working surface in which it is formed whereby said concave surface portion restricts the lateral displacement of the chock from the saddled rock formation.

3,957,238

CONVERTIBLE SYSTEM FOR PROVIDING A CONNECTION BETWEEN A SUPPORTING POLE AND ELECTRIC CABLES

Pierre Bourrières, Cahors, France, assignor to Manufacture d'Appareillage Electrique de Cahors, Cahors, France

Filed Dec. 9, 1974, Ser. No. 530,555
Claims priority, application France, Dec. 11, 1973, 73.44138
Int. Cl.[2] F16L 3/00
U.S. Cl. 248—68 R 6 Claims



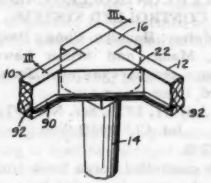
1. A convertible system for providing a connection between a supporting pole and electric cables for the purpose of either terminating or threading said cables, comprising a support fixed along the pole for a variable number of detachable and separate cable-retaining members, said members being slidably mounted on the support and disposed successively on said support, wherein the support comprises a bearing sole-plate attached to the pole and carrying a shaped longitudinal rib which projects outwards from the pole and is substantially vertical in the service position, the lower end of said rib being disposed opposite to a projecting flange of said sole-plate, the retaining members being each provided with an end-fitting having a profile which is complementary to the profile of the rib, said end-fitting being capable of free engagement over said rib at the upper end thereof and of sliding down to a position of abutting contact with said flange of said sole-plate, or with the end-fitting of the preceding member, said retaining members comprising, threading members provided with threading means for inserting a cable therethrough and said threading members being mounted on the support with a possibility of lateral angular displacement in a transverse direction with respect to said sole-plate.

3,957,239

JOINT CONSTRUCTION SUCH AS FOR FURNITURE AND METHOD OF MAKING

Mathew A. Slaats, and J. Richard Slayton, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed May 1, 1973, Ser. No. 356,105
Int. Cl.[2] F16M 11/16
U.S. Cl. 248—188 5 Claims



1. In a furniture joint construction; at least two rigid wood-like rail members substantially rectangular in cross section and having parallel outer and inner side surfaces and having top and bottom edges disposed in respective parallel planes,

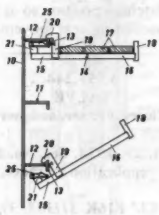
said rail members having a greater dimension between said edges than between said side surfaces, said members being disposed with the said inner side surfaces at an angle of less than 180° to one another, each member having one end part in juxtaposed relation to one end part of the other member, and a block of plastic material which undergoes an irreversible reaction upon curing molded and cured in situ on the juxtaposed said one end parts of said rail members and rigidly bonded thereto, said block of plastic material being rigid when cured and engaging at least the outer and inner side surfaces and bottom edges of said members and bonded to said outer and inner side surfaces and bottom edges, said block having outer faces spaced outwardly from the outer side surfaces of said rail members and having inner face means extending between the inner side surfaces of said rail members, said block having a top face substantially in the plane of the top edges of said members and having a bottom face disposed below said bottom edges of said rail members, said block having a socket formed therein through the bottom face and extending upwardly into said block between the said one end parts of said members, said socket adapted to receive the upper end of a leg member, said block being of ample dimensions to transmit substantial loads between said rail members, a panel in a plane between the planes of said top and bottom edges of said rail members, said rail members being grooved on the inner sides to receive the adjacent edges of said panel, and the region of said panel near the said juxtaposed one ends of said members extending into said block and being bonded thereto.

3,957,240

SCAFFOLDING BRACKET

Kurt Johansson, Torslanda, Sweden, assignor to AB Gotaverken, Goteborg, Sweden

Filed Apr. 10, 1975, Ser. No. 566,688
Int. Cl.² E04G *3/14, 5/06*
U.S. Cl. 248—214 **3 Claims**



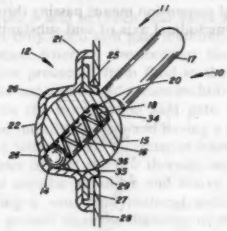
1. A scaffolding bracket for use at a vertical wall provided with horizontally extending strengthening bars, each bar having a downwardly turned flange along its edge remote from the wall, so as to provide a horizontal carrying surface and a retaining surface parallel to but spaced from the wall, said bracket including a beam having first and second portions, said beam being adapted to be attached to one of said strengthening bars by means of a hook member adapted to rest upon the supporting surface of said stengthening bar so the first portion thereof, in mounted position, will reach in below the one strengthening bar, while the second portion thereof protrudes horizontally outwards from the one strengthening bar, the improvement of a fixed, upwardly directed stanchion adjacent the inward end of the first portion of the beam, an arm, and means for pivotably connecting the arm to the upper end of said stanchion so a substantial part of said arm will be directed towards the hook member, while a shorter part of the arm is directed away from the retaining surface of said one bar.

3,957,241

BALL JOINT RELIEVABLE HANGER FOR TOWELS AND THE LIKE

Earl L. Morris, Whittier, and Larry D. Fields, La Puente, both of Calif., assignors to Acorn Engineering Company, Inc., Industry, Calif.

Filed Dec. 16, 1974, Ser. No. 533,002
Int. Cl.² F16B *45/00*
U.S. Cl. 248—288 **5 Claims**



1. A ball joint relievable hanger for mounting on a wall whereupon towels and the like may be hung, comprising:

a. a body having a hemispherically-shaped depression therein, said depression having a pair of spaced detents therein;

b. a hanger element comprising a ball-shaped member with a rod fixedly attached thereto and extending therefrom, said ball-shaped member being disposed in said depression in contiguous relationship to the wall forming said depression within said body and freely movable therein, said ball-shaped member further having a passageway with a single opening thereinto facing the wall forming said depression in said body;

c. compression biasing means disposed within said passageway in said ball-shaped member of said hanger element;

d. retaining means for capturing said ball-shaped member within said depression;

e. a locking element disposed within said passageway in said ball-shaped member of said hanger and freely movable therein, one end of said locking element being disposed between said biasing means and said opening facing said depression and formed to be receivable into said detent, whereby said rod is locked into an upward position to form a hanger for towels and the like when said biasing means urges said one end of said locking element into said detent following alignment therewith and when a substantial weight is impressed upon said rod in said locked position, said locking element in said passageway within said ball-shaped member is urged into said passageway towards said biasing means and out of said detent thereby unlocking said ball-shaped member from its previously fixed position and allowing said rod to fall downwardly and permitting said substantial weight to fall freely therefrom; and

f. said detents lying along a vertical plane passing through the center of said ball-shaped member, and being equally spaced above and below said center, whereby said hanger may be installed in either of two possible installation positions.

3,957,242

ROTATABLE HANGING DEVICE

Leonard Holtz, Oceanside, N.Y., assignor to Turn-Up, Inc., Oceanside, N.Y.

Filed July 25, 1974, Ser. No. 491,819
Int. Cl.² F16M *13/00*
U.S. Cl. 248—318 **24 Claims**

14. A rotatable hanging device adapted to be mounted to a fixed, substantially horizontal mounting surface, comprising:

a main member having a substantially central bore therethrough and having a first bearing surface which is substantially perpendicular to the longitudinal axis of said substantially central bore, said first bearing surface facing said substantially horizontal mounting surface;

an elongated, flexible suspension means having at least two interconnected legs non-removably secured to and depending from said main member substantially symmetrically about said substantially central bore and defining in combination with said main member an integral closed loop, said suspension means passing through an extension of the longitudinal axis of said substantially central bore

and being resiliently deflectable at least partially out of the path of said extension of said longitudinal axis, said suspension means further being non-rotatable relative to said main member and being adapted to receive and support an object to be hung; and

stationary mounting means extending through said substantially central bore of said main member for rotatably mounting said main member to said substantially horizontal mounting surface with said first bearing surface adjacent said substantially horizontal mounting surface, said main member being rotatable relative to said stationary mounting means.

3,957,243

LATCH MECHANISM FOR HORIZONTALLY OSCILLATING SEAT

Robert W. Costin, Troy, Mich., and Randal T. Murphy, Morristown, Tenn., assignors to Lear Siegler, Inc., Detroit, Mich.

Filed Mar. 3, 1975, Ser. No. 554,862

Int. Cl.[2] A45D *19/04*; **F16M** *13/00*

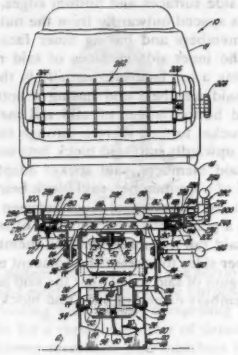
U.S. Cl. 248—370 **17 Claims**

1. A vehicle seat support assembly comprising:

a seat base for supporting a vehicle seat;

support means for supporting the seat base on a vehicle floor and including a sub-base on which the seat base is mounted by pivotal suspension links for oscillation forwardly and rearwardly with respect to the vehicle in a manner that isolates the seat base from horizontal longitudinal vehicle vibrations; and

a latch mechanism including a keeper fixed to one of the bases and having latch surfaces facing forwardly and rearwardly with respect to the vehicle, the latch mechanism also including a latch member pivotally mounted on the other base about an axis generally perpendicular to the pivotal axes of the suspension links for selective movement between latching and nonlatching positions with respect to the keeper, the latch member having latch surfaces that face forwardly and rearwardly with respect to the vehicle in the latching position to respectively engage the rearwardly and forwardly facing latch surfaces of the keeper, the engagement between the latch surfaces of the keeper and latch member selectively preventing the oscillating movement of the seat base in a rattle-free manner when the latch member is in the latching position, disengagement of the latch surfaces on the latch member and the keeper as the latch member is moved from the latching position to the nonlatching position permitting



the seat base to move in the oscillating manner in isolation from horizontal longitudinal vehicle vibrations, and an overcenter spring extending between the latch member and the base on which the latch member is pivotally mounted, the overcenter spring moving across the axis of pivotal latch member movement and thereby selectively and alternately biasing the latch member to either the latching or nonlatching position so as to prevent or allow the horizontal oscillating seat movement.

3,957,244

VALVE

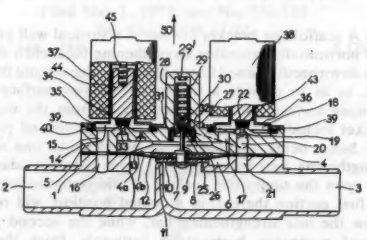
Michel Chauvigné, Cluses, France, assignor to Carpano & Pons S.A., France

Filed Oct. 29, 1974, Ser. No. 519,045

Claims priority, application France, Oct. 31, 1973, 73.38973

Int. Cl.[2] F16K *31/385, 31/40*

U.S. Cl. 251—30 **5 Claims**



1. A valve comprising, means defining a fluid inlet and means defining a fluid outlet, a valve seat intermediate said inlet and said outlet providing communication therethrough between said inlet and said outlet, a flexible diaphragm having a valve element thereon seatable on said valve seat for closing communication between said inlet and said outlet in response

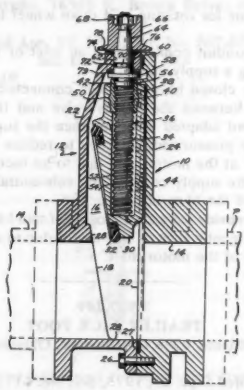
to fluid pressure upstream of said diaphragm acting on said diaphragm in a direction for seating said valve element, means defining in conjunction with a face of said diaphragm a fluid chamber upstream of said valve seat, means defining a narrow first passageway from said fluid inlet to said fluid chamber constantly in communication with said fluid chamber to maintain fluid pressure therein for applying pressure to said diaphragm for seating said valve element on said valve seat, means defining a second passageway of greater transverse dimension than said first passageway and providing communication between said fluid chamber and said outlet, a separately operated first valve for opening and closing said second passageway and biased to a closed condition, means defining a third passageway from said fluid chamber to said outlet and of greater transverse dimension than said first passageway, a separately operated second valve for opening and closing said third passageway resiliantly biased to a closed condition, means for opening said second valve in response to the unseating of said valve element and closing said second valve when said valve element is seated, means defining a fourth passageway of greater transverse dimension than said third passageway and extending between the inlet and said fluid chamber, a separately operated third valve for opening and closing said fourth passageway and biased to a closed condition, and means to operate said first and third valves selectively and independently.

3,957,245

GATE VALVE STRUCTURE

Joseph L. Daghe, Decatur, Ill., assignor to Mueller Co., Decatur, Ill.

Filed Nov. 26, 1974, Ser. No. 527,492
Int. Cl.[2] F16K *27/00, 31/50, 3/00*
U.S. Cl. 251—214 **9 Claims**



1. A gate valve structure for use in mains carrying fluid, said gate valve structure comprising:

a valve casing having a through-bore for the flow of fluid, said through-bore having an inlet end and an outlet end, an elongated chamber intersecting said through-bore intermediate its ends and defining inlet and outlet ports in said through-bore to the chamber, a valve seat surrounding at least one of said ports in said through-bore, and a bore in the valve casing to the exterior thereof;

a gate member having a chamber therein open to the exterior thereof by a bore, said gate member being slidable in the valve casing chamber from a closed position across said through-bore and seating against said valve seat to an opened position out of said through-bore;

means for moving said gate member between said closed and opened positions, said means including interior threads operatively positioned within the bore of the gate member chamber and a non-rising valve stem extending through and out of the valve casing bore, said non-rising valve stem including an annular shoulder defining a thrust collar and operatively bearing upon the interior of said casing, retaining means on a portion of said valve stem extending outwardly of said valve casing, seal means between said valve casing and a portion of said valve stem within said valve casing bore, and exterior threads on said valve stem cooperating with the interior threads of said gate member;

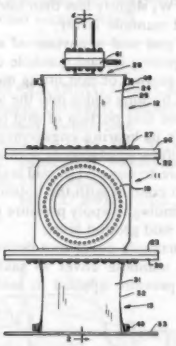
means to provide a seal between said valve stem and said gate member only when said gate member is in the fully opened position whereby the exterior threads on said valve stem are protected from fluid in the valve casing chamber, said last-mentioned means including an annular portion within the bore within said gate member outwardly of said interior threads and having a smooth cylindrical surface with a major diameter at least as great as a major diameter of said interior threads, said valve stem beneath said annular shoulder and above said exterior threads having a smooth cylindrical surface having a diameter no greater than the diameter of the cylindrical surface of the bore in said gate member, said cylindrical surface of said valve stem being arranged to telescope within the cylindrical surface of the bore in said gate member only when said gate member is in the fully opened position, an annular groove in one of said cylindrical surfaces and sealing means carried in said groove for sealing between said valve stem and said gate member only when said gate member is in the fully opened position.

3,957,246

GATE VALVE AND METHOD OF MANUFACTURE

Marvin H. Grove, Houston, Tex., assignor to M & J Valve Company, Houston, Tex.

Division of Ser. No. 441,328, Feb. 11, 1974, Pat. No. 3,905,082. This application May 15, 1975, Ser. No. 577,913
Int. Cl.[2] F16K *27/04, 27/10*
U.S. Cl. 251—329 **2 Claims**



1. In a gate valve construction, a valve body formed of at least two body parts, namely, a main body part and an upper body extension, the main body part having end walls provided with aligned openings forming flow passages, the body extension having its lower extremity secured to the upper extremity of the main body part whereby a vertically extending space is formed within the body to accommodate the gate, a valve gate disposed within the body space, sealing assemblies carried by the body and forming seals between the body and the surfaces of the gate, a bonnet assembly mounted on the upper extremity of the body extension, an operating rod connected to the gate and extending through the bonnet assembly, the body extension comprising end walls that are bulged outwardly and

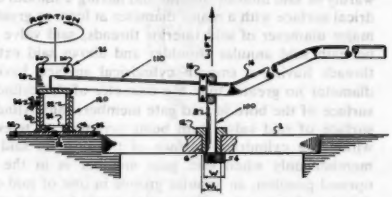
secured by welding along their edges to substantially parallel side walls, the side walls being arched inwardly, the upper extremity of the extension being substantially rectangular as viewed in plan, and an inwardly arched closure wall welded to said upper extremity of the extension and serving to close the same, said bonnet means being mounted on said upper closure member.

3,957,247

METHOD FOR LIFTING A MANHOLE COVER

George S. Haller, 359 Colt Drive, and Theodore C. Uphoff, 1298 Richard Road, both of N. Huntingdon, Pa. 15642

Filed Mar. 25, 1975, Ser. No. 561,863
Int. Cl.² B66F 11/00
U.S. Cl. 254—1 3 Claims



1. A method of raising and lowering a manhole cover from a manhole comprising the steps of:
   a. positioning a pivot means adjacent one edge of said manhole cover, said pivot means being stationary with respect to said one edge of said manhole cover;
   b. providing a means for engaging said manhole cover near the center so that said manhole cover will be raised generally vertical with respect to ground level, said means for engaging said manhole cover comprises a pad, having a width W slightly less than a width W_1 of an opening near the center of said manhole cover, said pad having a lifting means secured near one edge, and said lifting means having a bushing slidably mounted thereon, said bushing having a width W_2 slightly less than said width W_1 of said opening in said manhole cover;
   c. inserting said pad and a portion of said lifting means through said opening in said manhole cover;
   d. centering said portion of said lifting means in said opening so that said bushing slides into the annulus formed by said opening and said portion of said lifting means;
   e. placing a lever in bearing engagement with said pivot means and in lifting engagement with said lifting means;
   f. applying pressure to one end of said lever to bring the top of said pad into contact with the bottom of said manhole cover and continuing to apply pressure until said manhole cover is above said ground level;
   g. pivoting said manhole cover to a desired position; and
   h. lowering said manhole cover to said ground level by releasing said pressure applied to said one end of said lever.

3,957,248

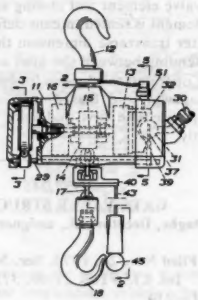
AIR HOIST WITH AN OVERLOAD PROTECTION DEVICE

Gunnar Christer Hannson, Stockholm, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 336,385, Feb. 27, 1973, Pat. No. 3,876,182. This application Sept. 16, 1974, Ser. No. 506,608
Claims priority, application Sweden, Mar. 6, 1972, 2816/72
The portion of the term of this patent subsequent to Apr. 8, 1992, has been disclaimed.
Int. Cl.² B66D 1/00
U.S. Cl. 254—168 24 Claims

1. An air hoist comprising:
   a rotatable drive wheel carrying a line which in turn is adapted to carry a work load,
   an air motor for rotating said drive wheel to retrieve said line,
   a supply conduit connected to an inlet of the motor for supplying motive air to the motor,
   a normally closed blow-off valve connected to said supply conduit so as to effect, when in an open position, a reduction of the motive air pressure at the inlet of said motor due to an increased pressure loss in said supply conduit and substantially located upstream of the blow-off valve, whereby to limit the power of the motor, and
   a load sensing device arranged to initiate the opening of the blow-off valve in response to the tension in the line reaching a predetermined magnitude.

23. An air hoist comprising:
   a rotatable drive wheel carrying a line which in turn is adapted to carry a work load,



   an air motor for rotating said drive wheel to retrieve said line,
   a supply conduit connected to an inlet of the motor and including a supply valve,
   a normally closed blow-off valve connected to the supply conduit between the supply valve and the inlet of the motor and adapted to open when the supply conduit is suddenly pressurized, whereby to reduce the motive air pressure at the motor inlet due to an increased pressure loss in the supply conduit and substantially located upstream of the blow-off valve, and
   means to provide for a slow closing of said blow-off valve to ensure a gentle start of said motor due to a slow pressure build-up at the motor inlet.

3,957,249

TRAILER JACK FOOT

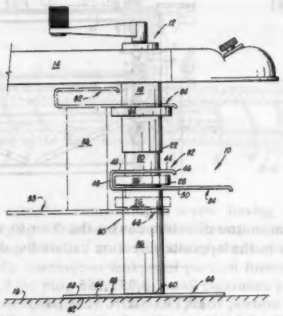
Hugh M. Williams, 6308 Commodore, Oklahoma City, Okla. 73132

Filed Sept. 29, 1975, Ser. No. 617,361
Int. Cl.² B66F 7/26
U.S. Cl. 254—45 8 Claims

1. In combination with a trailer jack for supporting a portion of the weight of a trailer on the ground, the jack having a vertically extending housing and an extensible member movable up and down through the lower end of the housing:
   a horizontally extending flange on the housing;
   a horizontally extending flange on the lower end portion of the extensible member; and,
   a jack extender attachable to the extensible member above the flange thereon to extend the effective length of the jack, and, alternately, to the jack housing above the flange thereon for storage, comprising:
      a first hanger engaging the flange on the extensible member when the jack extender is positioned to extend the length of the jack;
      a second hanger connected to, but positioned below and extending to one side of, the first hanger and engaging

the flange on the housing when the jack extender is in a storage position;

a support portion connected to, and extending vertically downward from, the first and second hangers substantially in line with the extensible member when the jack extender is positioned to extend the length of the jack; and



foot means on the lower end of the support portion for engaging the ground when the jack extender is positioned to extend the length of the jack and for engaging the lower end of the extensible member when the jack extender is in a storage position.

3,957,250

PLASTIC FENCE POST

Stanley E. Murphy, 16355 E. Brown Drive, Aurora, Colo. 80013

Filed Apr. 14, 1975, Ser. No. 567,557

Int. Cl.² E04H *17/14*

U.S. Cl. 256—19 **3 Claims**

1. An improved fence post for supporting strands of fence wire comprising:

a. a hollow, tubular body of a uniform internal and external diameter having a sidewall fabricated from a dielectric, high strength plastic material which is impervious to weather and soil conditions, said body having a lower buried anchoring portion and an upper exposed portion,

b. said lower buried portion having one or more, relatively short, transverse anchoring tubes inserted through aligned holes in said body and arranged to extend a short distance beyond the sides of said body whereby when the post is buried in the ground said tubes will prevent the rotation of the post and secure it firmly in the ground;

c. the exposed portion of said body has a plurality of vertically spaced holes on opposite sides of said tubular body being generally pairs of aligned holes passing through said body, each of said pairs of holes having an insert tube affixed therein and sealed to the sidewall of said body, at least one of said insert tubes having fence wire securing means arranged therethrough to support said fence wire above the ground; and

d. said body being filled with a lightweight, substantially rigid material whereby said body is reinforced and strengthened.

3,957,251

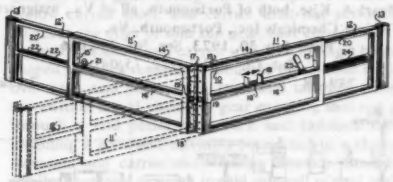
GATE BARRIER

Lester C. McCracken, 28247 203rd Ave. SE., Kent, Wash. 98031

Filed Aug. 8, 1974, Ser. No. 493,437

Int. Cl.² B21F *27/00*

U.S. Cl. 256—47 **8 Claims**



1. A barrier, comprising:

a pair of tubular panel sections including a rectangular framework having a pair of rectilinear members and end members connecting terminal ends of said rectilinear members, said panel sections being connected by a hinge connecting end members, said panel sections being selectively locked in a straight, linear configuration by a dagger which may be selectively extended through apertures in said end members and through aligned rectilinear members;

extensible sections each having a pair of rails which may slidably telescope within said rectilinear members at their ends opposite said hinge, means selectively locking said extensible sections with said panel sections, carried on said rectilinear members and said rails thereof; and

abutment bars fastened at the outermost terminal ends of said rails said abutment bars are pivotally fastened to said rail for restricted arcuate travel.

3,957,252

APPARATUS FOR CLEANING MEDICAL INSTRUMENTS

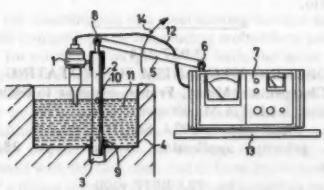
Karl Storz, Tuttlingen, Germany, assignor to Storz-Endoskop GmbH, Schaffhausen, Switzerland

Filed June 17, 1974, Ser. No. 479,822

Claims priority, application Switzerland, Nov. 7, 1973, 15629/73; Apr. 30, 1974, 5928/74

Int. Cl.² B01F *11/02*

U.S. Cl. 259—1 R **2 Claims**



1. Apparatus for cleaning medical instruments in a conventional sink having a drain opening, comprising:

a. an elongated overflow pipe adapted for removable registry at its lower end with the drain opening of a sink and having an inlet opening intermediate its ends for defining the maximum level of water in a sink,

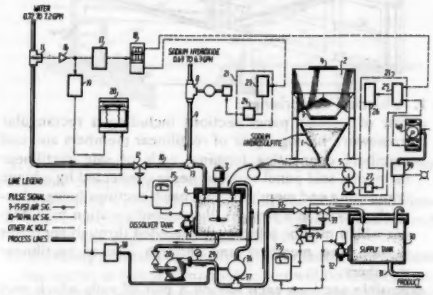
b. an ultrasonic oscillator mounted on the upper end of the overflow pipe and projecting below the inlet opening therein for engaging washing water in a sink,
c. a separate switch box for the oscillator adapted to be supported adjacent a sink,
d. an elongated electric cable interconnecting the oscillator and switch box, and
e. an elongated arm pivotally connected at one end to the switch box and at the opposite end to the oscillator.

3,957,253

APPARATUS FOR AQUEOUS SOLUTIONS OF PURE SODIUM HYDROSULFITE

Robert W. Barton, Chesapeake; Joseph A. Cannizzaro, and Mearl A. Kise, both of Portsmouth, all of Va., assignors to Virginia Chemicals Inc., Portsmouth, Va.

Filed July 30, 1973, Ser. No. 384,086
Int. Cl.[2] B01F *7/22, 15/04*
U.S. Cl. 259—8 **7 Claims**



1. Apparatus for preparing a solution of two liquids and a powdered solute, comprising:
A. a dissolving tank;
B. means disposed in said dissolving tank for mixing any contents thereof;
C. sources of first and second liquids and a source of powdered solute;
D. conduit means for admitting a stream of the first liquid into said dissolving tank;
E. means for injecting a variable weight of the second liquid into said stream of the first liquid in accordance with the weight of the first liquid flowing in said conduit means;
F. means for admitting to said dissolving tank a variable weight of said powdered solute in accordance with the weight of the first liquid flowing in said conduit means;
G. means for delivering mixed solution from said dissolving tank to use points; and
H. means for monitoring the flow rate of the first liquid in said conduit means and producing an output proportional thereto.

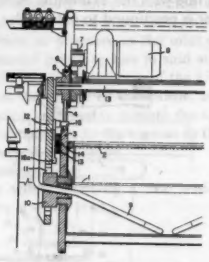
3,957,254

DOOR OPENING MECHANISM FOR ROTATING DRUM

Jean G. Charpentier, Massy, France, assignor to Societe Anonyme dite: S.I.E.T.A.M., France

Filed Sept. 9, 1974, Ser. No. 504,146
Claims priority, application France, Sept. 25, 1973, 73.34376
Int. Cl.[2] B01F *9/00*
U.S. Cl. 259—89 **2 Claims**

1. A drum of the suspended type which comprises a double flanged wheel laterally at each end of the drum, a belt for suspension of said wheel to a rotary drive pulley, a swing door opening inwardly in the drum, a pivoting arm mounted on the drum, means for connecting said swing door to said arm, said arm having a catch, said door having a groove, said groove having notches for engagement with said catch, said notches being of depth substantially equal to the sum of the depth of the groove and the diameter of the catch, whereby rotation of



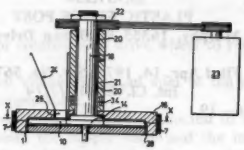
the drum in one direction causes the door to swing open and rotation in the opposite direction causes the door to close.

3,957,255

EXTRUSION MACHINE

George Berfert Groom, Woodlands, Wragby, Lincoln, England

Filed Dec. 6, 1973, Ser. No. 422,342
Claims priority, application United Kingdom, Dec. 7, 1972, 56540/72
Int. Cl.[2] B29B *1/06*
U.S. Cl. 259—185 **10 Claims**



1. A machine for processing thermoplastic material comprising a casing including two generally opposing surfaces which at least in part define an enclosed working chamber, means for heating and controlling the temperature of the two surfaces of the working chamber, a gravity fed hopper for introducing said material through an inlet into the working chamber and an outlet for leading processed material away from the working chamber, a rotor mounted for rotation within the casing and having a root and a plurality of blades extending outward form said root and disposed between the said surfaces of the working chamber with adjacent blades separated by an open space defined by thrust faces of adjacent blades and portions of the two surfaces of the working chamber, each blade extending from the region of the inlet to the region of the outlet and each blade including generally oppositely directed first and second surfaces with the first blade surface closely confronting one of said surfaces of the working chamber to form a first region of shear and with the second blade surface closely confronting the other said surface of the working chamber to form a second region of shear, the blades being so shaped to transport material from the inlet to the outlet by the angle of the blades and the forces arising from the difference between the surface area of the thrust faces of the blades and the relatively larger area of the generally opposed surfaces of the working chamber and serving, in use, to produce multiple shearing action and mixing action and improved heat transfer in the material contained in the spaces during transport action and processing thereof from the inlet to the outlet.

3,957,256

SCREW EXTRUDER

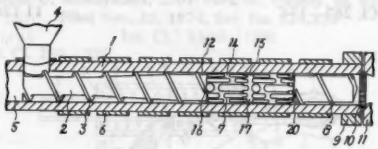
Kenkichi Murakami, Osaka, Japan, assignor to Kabushiki Kaisha Plastic Kogsku Kenkyusho, Osaka, Japan

Filed Mar. 26, 1974, Ser. No. 454,926

Claims priority, application Japan, Apr. 5, 1973, 48-39268; Sept. 8, 1973, 48-101404

Int. Cl.² A21C *1/06*; B29B *1/10*; B29F *3/02*

U.S. Cl. 259—193 18 Claims



1. A screw extruder comprising a screw having a screw flight for conveying a fluid and rotatably housed in a cylinder, at least one plug installed in a portion of the screw and a circumferentially continuous leakproof portion formed on at least one part of the plug with only a small clearance provided between the outer periphery of the leakproof portion and the inner surface of the cylinder, the plug being formed with a plurality of through connecting holes therein, interconnecting a space upstream of the leakproof portion and another space downstream thereof, with said connecting holes having inlet and outlet portions in the form of a plurality of auxiliary inlet flow passages circumferentially arranged in a definite order on a part of the leakproof portion of said plug and a plurality of corresponding auxiliary outlet passages circumferentially arranged on another part of the leakproof portion of said plug spaced downstream of said inlet flow passages on said plug, wherein the order of arrangement of the inlets of each of the connecting holes is different from the order of arrangement of the corresponding outlets designed to communicate with said inlets sequentially in a circumferential direction about said screw plug.

3,957,257

HARDENING APPARATUS WITH A HARDENING TANK, ESPECIALLY IN HARDENING MACHINES FOR CRANKSHAFTS

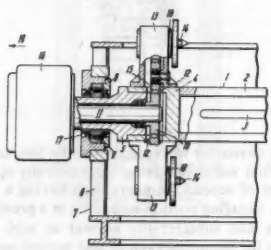
Edgar Stengel, Wuppertal-Hahnerberg, Germany, assignor to AEG-Elotherm G.m.b.H., Remscheid, Germany

Filed June 26, 1974, Ser. No. 483,453

Claims priority, application Germany, Aug. 30, 1973, 2343684

Int. Cl.² C21D *1/66*

U.S. Cl. 266—133 1 Claim



1. In a hardening apparatus of the type including a hardening tank for containing a liquid up to a selected level in said tank, a carrier shaft having a longitudinal axis, said shaft being horizontally mounted in said tank to be rotatable about its longitudinal axis, bearing means removably mounted in an opening in the side of said tank for rotatably mounting a hollow drive shaft extending through said opening, said carrier shaft having a pair of carrier spiders for turning the workpieces around their respective axes and for simultaneously clamping down several workpieces each having its own rotational axis, drive means mounted outside of said tank side wall and coupled to said hollow drive shaft for producing partial turns of said carrier shaft, a gear driving shaft disposed within said hollow drive shaft and coupled at one end thereof to said drive means and at its other end to a sun gear for turning said carrier spiders by way of a planetary gear disposed in each said carrier spider,

the improvement wherein said carrier shaft is hollow and at one end is connected to said hollow drive shaft, said sun gear on said gear driving shaft is disposed within said hollow carrier shaft, said carrier shaft has perforations adjacent the edge of said sun gear, said carrier shaft has flat surfaces and a said carrier spider including a housing-shaped tailstock removably mounted on said flat surfaces over each said perforation, each said tailstock carrying therewithin a said planetary gear engaging said sun gear through a said perforation, each said tailstock further including a gear unit drivingly connected to a clamping element, said carrier shaft having exterior dimensions smaller than said opening in said sidewall of said tank so that, when said tailstock and said bearings are removed, said carrier shaft can be moved through said opening in the side of said tank.

3,957,258

NOZZLES OF THE LANCE HEADS FOR BLOWING OXYGEN FROM ABOVE IN THE REFINING PROCESSES

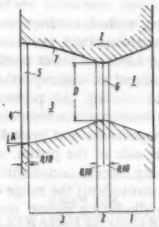
Giovanni Maria Carlomagno, Neaples; Antonio Cecere, Taranto; Bruno Costa, Neaples; Nicola Muni, Taranto, and Luigi Napolitano, Neaples, all of Italy, assignors to Italsider S.p.A., Genoa, Italy

Filed Aug. 5, 1974, Ser. No. 494,436

Claims priority, application Italy, Aug. 8, 1973, 12791/73

Int. Cl.² C21C *7/00*

U.S. Cl. 266—225 4 Claims



1. In the combination of a steel making furnace including a vessel for containing a bath including molten iron and slag and a lance for conveying oxygen to the bath, the lance including a nozzle for causing the oxygen to eject from the lance as a jet, the nozzle having for the conveyance of the oxygen a passage defined by walls surrounding the passage and having a first zone defined by convergence of the walls in the direction in which the oxygen is to travel through the nozzle, a second zone joined with the first zone and defined by formation by the walls of a throat in the nozzle, the throat including the smallest cross sectional area of the nozzle passage, and a third zone joined with the second zone and defined by divergence of the walls in the direction in which the oxygen is to travel through the nozzle, the improvement in which in the third zone the walls are concave, at the juncture of the second zone with the third zone the walls are convex, the concave portion of the walls curvilinearly merges with the convex portion of the walls so that no angle is formed, the downstream end of the throat

is defined by the boundary between the convex portion of the walls and the concave portion of the walls and the downstream end of the throat is spaced from the downstream extreme of the smallest cross section of the throat a distance equal to one-tenth the diameter of the smallest cross section.

3,957,259

APPARATUS FOR CYLINDERS TO BE FILLED WITH PRESSURISED GAS

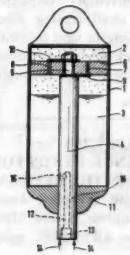
Carl Ullrich Peddinghaus, Obere Lichtenplatzer Str. 276, Wuppertal-Barmen, Germany

Filed Mar. 5, 1974, Ser. No. 448,240

Claims priority, application Germany, Mar. 8, 1973, 2311477; Dec. 22, 1973, 2364226

Int. Cl.² F16F 9/43

U.S. Cl. 267—64 R 5 Claims



1. A fluid-damping cylinder which can be filled with a damping fluid and a pressurized gas from a suitable supply, comprising a housing having a lower portion adapted to contain the damping fluid and an upper portion contiguous therewith and adapted to contain the pressurized gas; a piston mounted for sliding movement within the cylinder between the upper and lower portions and providing a chamber with the housing on either side of the piston, said piston having at least one valve opening therein communicating said chambers with each other and throughout the range of movement of said piston within said cylinder; a piston rod connected to the piston and extending from one side thereof outwardly of the lower end of the cylinder through a seal at least a distance sufficient to permit the piston to be moved into the upper portion of the cylinder containing the pressurized gas, said piston rod having an axial bore, an inlet to said bore adjacent the outer end of the piston rod, and a radial bore communicating with the axial bore, said bores and said inlet forming a communication between the supply and the interior of the chamber on said one side of the piston when said piston is located in the upper portion of the cylinder with said radial bore in communication with the lower chamber but not when the piston is located in the lower portion of the cylinder with said radial bore external to said lower chamber, whereby during assembly or recharging of the cylinder the piston may be extended into the upper portion of the cylinder and gas fed under pressure through said inlet and bores into said cylinder, while during use and when the piston operates in the lower portion of the cylinder the communication is broken, and means for detachably connecting the inlet with the supply of pressurized gas.

3,957,260

DEVICE FOR CHANGING THE AMOUNT OF LINEAR MOVEMENT IN A LINKAGE

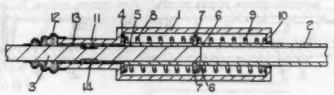
Frederick Raymond Patrick Martin, Bromley, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Apr. 5, 1974, Ser. No. 458,401

Claims priority, application United Kingdom, Apr. 6, 1973, 16524/73

Int. Cl.² F16F 1/06

U.S. Cl. 267—174 11 Claims



1. A device for changing the amount of linear movement in a linkage system, comprising a slidable first element, a slidable second element, a fixed part relative to which said first and second elements are slidable, a first resilient member through which said second element is operably connected to said first element, and a second resilient member disposed between said second element and said fixed part and arranged to act in opposition to said first resilient member so that an equilibrium is established therebetween, one of said elements providing an input and the other of said elements providing an output, whereby when said equilibrium is disturbed by movement of the input element, the output element moves as a result of re-establishment of the equilibrium between the first and second resilient members.

3,957,261

HOLDING DEVICE FOR WORKPIECES AND THE LIKE

Walter Hefel, Rosgartenstrasse 22a, Kreuzlingen, Thurgau, Switzerland

Continuation of Ser. No. 366,024, June 1, 1973, abandoned. This application Oct. 29, 1974, Ser. No. 518,869

Claims priority, application Switzerland, June 1, 1972, 8159/72

Int. Cl.² B25B 5/10

U.S. Cl. 269—243 8 Claims

1. A holding device for workpieces and the like, comprising an elongated first member having longitudinally spaced end portions; a pair of second members each having a mounting portion and an engaging portion extending in a predetermined direction from and substantially normal to said mounting portion; means for mounting each of said second members on said first member for displacement longitudinally thereof, including a channel for a regular polygonal cross section provided in one of the respective end portion and mounting portion, the other of said respective mounting portion and end portion having a section of corresponding regular polygonal cirumference which is matingly receivable in said channel in as many different angular positions as there are sides of the

polygon so that each respective engaging portion can extend transversely of the elongation of and beyond said first member in as many individually selected directions; and means for displacing said second members toward and away from one another longitudinally of said first member so as to engage and disengage the workpiece.

3,957,262

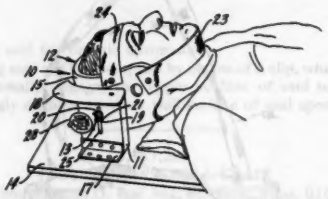
HEAD SUPPORTING AND IMMOBILIZING DEVICE

William U. McReynolds, 2301 York St., Quincy, Ill. 62301

Filed Nov. 25, 1974, Ser. No. 526,534

Int. Cl.² A61G *13/00*

U.S. Cl. 269—328 20 Claims



1. A head supporting and immobilizing device comprising:

a. a headpiece having a curved upper surface shaped to approximate the contour of a patient's head and formed to receive the patient's head, said surface extending about the back, top and sides of the patient's head whereby the head is rigidly supported and immobilized, and

b. generally vertical support means attached to said headpiece, said support means having a base adapted to affix said headpiece to a patient's body-supporting surface and having means for steadying a portion of a physician's arm.

3,957,263

TELESCOPIC SUCTION MEMBER FOR FEEDING SHEET MATERIAL

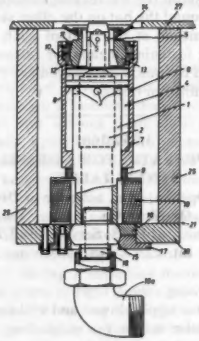
Klaus Christl, Chavannes, Switzerland, assignor to J. Bobst & Fils S.A., Switzerland

Filed Mar. 2, 1973, Ser. No. 337,749

Claims priority, application Switzerland, Mar. 29, 1972, 4708/72

Int. Cl.² B65H *3/08*

U.S. Cl. 271—102 22 Claims



1. A telescopic suction head assembly comprising a body, a cylinder slidable longitudinally on said body, a suction head, means for freely pivotally mounting said suction head on an end of said cylinder, whereby said suction head is free to freely tilt relative to said body and free to move rectilinearly relative to said body, and body mounting means for mounting said body in pivotally adjustable relation above a fixed support member, said body mounting means allowing said body to pivot equally freely in any direction relative to said support member.

3,957,264

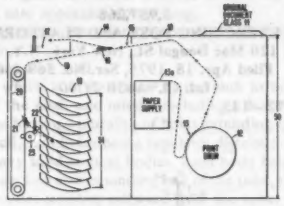
COLLATOR BINS

Paul S. Bach, Boulder, Colo.; James A. Craft, Lexington, Ky.; Gerald B. Lammers, Boulder County, and James C. Rogers, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 7, 1975, Ser. No. 602,957

Int. Cl.² B65H *39/10*

U.S. Cl. 271—173 9 Claims



1. In a collator adapted to receive curled paper sheets from a printer or copier, and operable to collate the sheets to a plurality of bins, comprising:

means serially feeding said sheets to said bins as the sheets travel in a direction generally normal to the direction of curl;

a plurality of vertically spaced and generally horizontally extending, electrically nonconductive surface members, adjacent ones of which define a bin;

each of said surface members having an upward-facing generally concave planar surface upon which the copy sheets rest in a vertical stack, said concave surface having a greater curvature than the curl of the copy sheets, the axis of said concave surface being generally normal to the direction of sheet travel;

whereby the copy sheets rest in a stack with the leading and trailing edges thereof in packed registry against said planar surface.

3,957,265

APPARATUS FOR STRAIGHTENING STACKS OF SHEET MATERIAL

Gunnar Jelsness-Larsen, St. Mariegate 39, 1700 Sarpsborg, Norway

Filed Apr. 15, 1974, Ser. No. 460,892

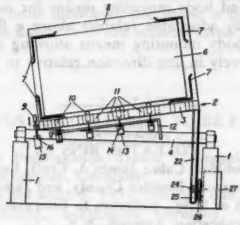
Claims priority, application Norway, Apr. 13, 1973, 1563/73

Int. Cl.² B65H *31/34*

U.S. Cl. 271—213 8 Claims

1. In an apparatus for straightening stacks of sheet material and including a base on which there is rotatably mounted a device for supporting, in an initial position thereof, a stack of horizontally disposed sheets, and being operable to be rotated, with the stack placed thereon, from said initial position to a position in which the stack is resting on a support with the sheets in essentially vertical position and against an abutment edge in the form of a stacking strip, the improvement comprising a lifting device which by means of an operating device is operable to be raised from an initial position below the support plane of the support to a position above the support in

order to keep the sheet stack raised above the support plane, and being operable to be lowered to said initial position



wherein it does not effect any lifting action, and means for lowering said stacking strip to a position below said support plane.

3,957,266

EXERCISING POST AND PLATFORM

Max Rice, 120 Mac Dougal St., New York, N.Y. 10012

Filed Apr. 18, 1975, Ser. No. 569,460

Int. Cl.² A63B *21/00*

U.S. Cl. 272—125 **1 Claim**

1. In an exercising post and platform assembly, the combination of a platform upon which a person can stand, and an upwardly extending post being supported upon said platform, said post being comprised of interconnected pipe sections each having a smooth outer surface consisting of slippery Teflon material so that a firm non-slip grasp thereof by hands of a user will not be possible; said platform comprising a flat metal plate having a raised pattern upon its upper side, a plurality of legs underneath said plate, fixed feet at one end of said legs and vertically adjustable feet at the other end thereof, and railings along opposite edges of said plate, a rectangular box mounted upon said plate, a square opening at an upper end of said box, an upper edge of said box being parallel to said plate, a ball and socket joint contained within said box having a socket secured to said platform, and a stub shaft integral with the ball of said joint, said shaft protruding upwardly out of said box., said post being detachably attached to said stub shaft, and a flange around a lower end of said post covering said box opening, said post pivotable about said joint abutting said box upper edge at extreme tilt of said post, said post having increasing greater tilt when tilted closer to a square corner of said box upper edge, said pipe sections being detachable attached together by bayonet slots and projections received therein.

3,957,267

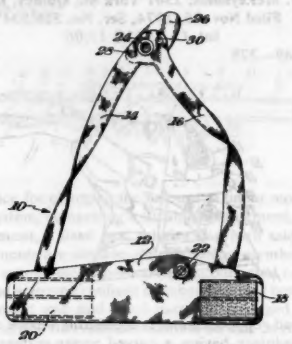
SAFETY RESTRAINER FOR BAT

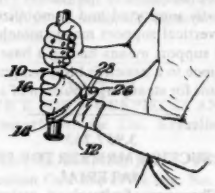
Angelo R. Vitalo, 1306 Barksdale Road, Newark, Del. 19711

Filed Aug. 9, 1974, Ser. No. 496,290

Int. Cl.² A63B *69/40*

U.S. Cl. 273—26 C **6 Claims**





1. A quick-release bat restrainer comprising a cuff for securing around a wrist, the cuff carrying two elongated loop members of flexible restraining material, each loop member having each of its ends secured by securing means to said cuff, said loop members having lengths such that when a bat is held in the hand to which the cuff is secured, both loop members loop around and loosely engage the bat alongside said hand, one loop looping around the bat on one side of the hand, and the other looping around the bat on the other side of the hand, and said securing means at one end of each loop member being quick-release fastening means for releasably fastening them to the cuff and for quick disengagement by brushing the fastening means against an object.

3,957,268

METHOD AND APPARATUS FOR ASSEMBLY OF TABLE TENNIS TABLE

Ira J. Silberman, Opelika, Ala., assignor to Diversified Products Corporation, Opelika, Ala.

Filed Mar. 26, 1975, Ser. No. 562,218

Int. Cl.² A63B *59/04*

U.S. Cl. 273—30 **8 Claims**

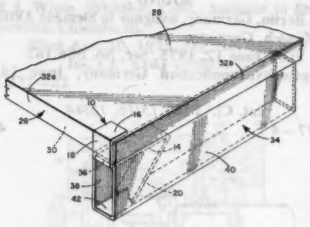
1. A table comprising:

a top having planar upper, lower and end surfaces;

at least one tubular apron for supporting said top, said apron having a substantially planar top wall engaging said lower table surface; and

a clip attaching said top to said apron, said clip frictionally engaging said upper table surface and bitingly engaging an inner wall surface of said apron.

8. A method for attaching the top of a table to a tubular apron for supporting said top, comprising the steps of:



placing said top on said apron; and

clipping said top to said apron by means of a clip, which clip frictionally engages the upper surface of said top and bitingly engages an inner wall surface of said apron.

3,957,269

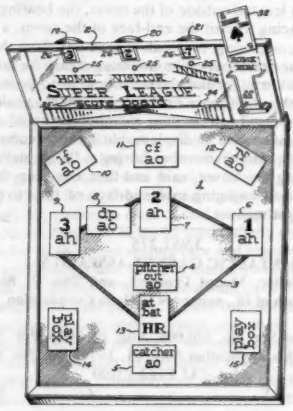
TACTICAL BASEBALL GAME

Reginald Bouchard, P.O. Box 342, Florence, Mass. 01060

Filed Mar. 21, 1975, Ser. No. 560,987

Int. Cl.² A63F *3/00*

U.S. Cl. 273—93 C **4 Claims**



1. A game for playing baseball comprising two independent decks of conventional playing cards, a horizontal board having appearing thereupon a baseball diamond, with the following stations: at bat, first, second, third, short stop, left field, right field, center field, a play box for the offensive team, a play box for the defensive team, a home run position, said board including means for keeping a record of the runs for each team and a record of the innings, said at bat station being a home run position, said first, second and third bases being automatic hit positions, said left field, center field, right field and short stop stations being automatic out positions, a vertical scoreboard, said scoreboard having a fastening means for connecting to said horizontal board at right angles thereto, said scoreboard containing means for varying the indicia for the runs of each of the teams so as to keep a record thereof, means for varying the indicia for the innings to keep a record thereof, means for supporting a playing card from one of the decks which is a "home run card", and a spinner mounted on a surface having a plurality of segments thereon with the indicia of the various playing cards with the number, letter, and the suit of a card, said spinner assembly as described being used for pinch hitting.

3,957,270

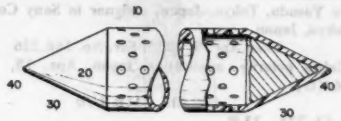
GAME: WHISPERING STICK

Arisztid Z. Fekete, Lakewood, Ohio, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 24, 1974, Ser. No. 481,956

Int. Cl.² A63B *71/02*

U.S. Cl. 273—95 F **4 Claims**



1. Outdoor game apparatus adapted to be used by at least one player, said apparatus comprising:

a goal disposed on a section of ground remote from a staring location;

at least one club; and

a missile which is to be struck by the club to be propelled toward the goal, said missile including a hollow cylindrical tube having a plurality of holes extending through the tube wall, said holes being regularly distributed, and two like heavy solid conical bodies, each body being secured at its base to a corresponding end of the tube, the vertices of the cones pointing outward from the tube, the axis of the tube and the axes of the bodies being coincident.

3,957,271

SELECTIVELY ADJUSTABLE DARTS

Ronald A. Kurtz, Englewood, and Henry Utzinger, Ridgewood, both of N.J., assignors to Kulite Tungsten Corporation, Ridgefield, N.J.

Filed Mar. 17, 1975, Ser. No. 558,967

Int. Cl.² A63B *65/02*

U.S. Cl. 273—106.5 R **3 Claims**

1. A dart comprising:

a. a shaft member terminating in one end in a point and an opposite end in a relatively long cylindrical member having a threaded portion furthest removed from said point,

b. a plurality of annular weight members, each having a central aperture with said central apertures located about said cylindrical member between said pointed and said threaded portion, at least one of said weights fabricated from a different density metal than another, but being relatively of the same dimensions,

c. a washer emplaced on said threaded portion and in proximity with the last one of said weights furthest removed from said point end,

d. a metallic cylindrical coupling member having a first threaded aperture in one end for coacting with said threaded portion of said long cylindrical member to retain said weights on said shaft member while permitting selective removal or addition of the same, a second threaded aperture relatively colinear with said first and located at an opposite end of said cylindrical member, whereby the central portion of said cylindrical member is solid metal,

e. a flight accommodating section of a longer length than said coupling member and fabricated from a material which is substantially lighter than any material used in said shaft member and said annular weights, said section having a front threaded shaft for coacting with said second aperture in said cylindrical coupling member and having at an opposite end, a plurality of radially extending flight control means.

3,957,272

CARTRIDGE SHELL FOR PHONOGRAPH PICKUP

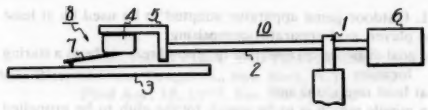
Shiro Yasuda, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 9, 1975, Ser. No. 566,226

Claims priority, application Japan, Apr. 18, 1974, 49-43964[U]

Int. Cl.² G11B 3/10

U.S. Cl. 274—23 R 7 Claims



1. A phonograph tone arm assembly comprising a tone arm, a cartridge shell and a phonograph pick-up cartridge, said cartridge shell including an L-shaped member formed of a large number of carbon fibers bonded together by a synthetic resin into an L-shape having a horizontal leg portion and a vertical leg portion, and a metal plate of L-shape firmly secured to the upper surface of said horizontal leg of said L-shape fiber member and to the outer end surface of said L-shape fiber member, said cartridge being secured to the under surface of the horizontal leg of said shell and said shell having its vertical leg secured to the end of said tone arm.

3,957,273

STYLUS HOLDER

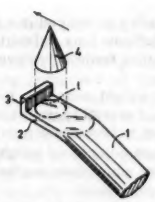
Wilhelmus Henderikus Johannes Bons, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, Briarcliff Manor, N.Y.

Filed Sept. 23, 1975, Ser. No. 616,051

Claims priority, application Netherlands, Oct. 1, 1974, 7412915

Int. Cl.² G11B 3/02

U.S. Cl. 274—37 5 Claims



1. A stylus holder for electromechanical transducers for the reproduction of audio and/or video information contained in a groove of a record carrier, which holder at one flat end is provided with an at least partly substantially conical stylus with a round or polygonal base which is glued to the holder, chacterized in that a portion of said end is bent towards the side of the stylus through an angle of at least approximately 90° and the stylus is glued to the holder so as to engage the bent portion.

3,957,274

SEALING ARRANGEMENT FOR A MACHINE WITH A COVER INSULATED AGAINST STRUCTURE-BORNE SOUND

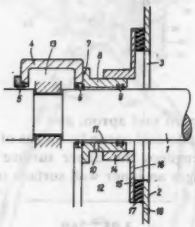
Karl Lang, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed June 12, 1975, Ser. No. 586,162

Claims priority, application Germany, June 14, 1974, 2428905

Int. Cl.² F16J 15/16, 15/44

U.S. Cl. 277—4 4 Claims



1. In a machine such as an electrical machine or the like equipped with a shaft defining a shaft axis and with a cover having an end-face with a shaft lead-through accommodating the shaft, the cover being installed so as to be insulated against structure-borne sound, the machine further being equipped with a bearing located outside of the cover, the bearing having an end-face facing toward the end-face of the cover, a sealing arrangement comprising: two seals spaced one from the other to define a space therebetween; mounting means for mounting said seals at said end-face of the bearing so as to be in sealing contact with the shaft; bore means for connectng said space to the ambient; and, an annular member mounted on said mounting means so as to be displaceable in the direction of the shaft axis, said annular member having a flange defining an end-face facing the cover, said end-face covering the shaft lead-through and engaging said end-face of the cover in an elastic seal-tight manner.

3,957,275

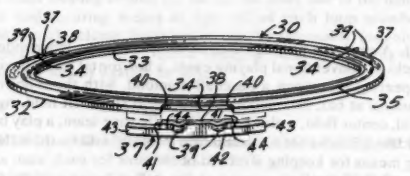
METALLIC GASKET ASSEMBLY

Jerome G. Belter, Mount Prospect, and Dan C. Battistoni, Chicago, both of Ill., assignors to Dana Corporation, Toledo, Ohio

Division of Ser. No. 380,008, Aug. 20, 1973, Pat. No. 3,874,675. This application Nov. 11, 1974, Ser. No. 522,899

Int. Cl.² F16J 15/00

U.S. Cl. 277—11 5 Claims



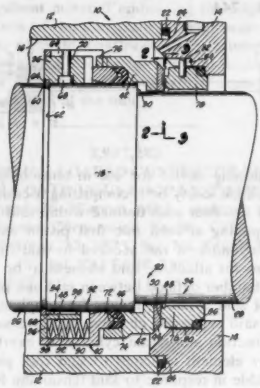
1. A metallic gasket assembly comprising, in combination, a ring-shaped main gasket body having a predetermined thickness, said main gasket body defining an insert opening in its outer periphery having circumferentially spaced edges, and a metallic insert having a portion positioned within said insert opening, at least one embossment formed in said insert portion, said insert portion having edges positioned tightly against said circumferentially spaced insert opening edges whereby said metallic insert is secured to said main gasket body and said metallic insert further having a portion projecting past a side of said main gasket body.

3,957,276

MECHANICAL SEAL WITH PRESSURIZED LUBRICATION POCKETS

Winfred J. Wiese, Whittier, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 10, 1975, Ser. No. 566,874
Int. Cl.² F16J 15/00, 15/34
U.S. Cl. 277—22 8 Claims



1. In a mechanical seal assembly for sealing a rotatable shaft to a housing, said seal assembly having a rotating seal subassembly and a stationary seal subassembly, said subassemblies each having a sealing ring with sealing faces in contact with one another, said sealing rings being exposed to a fluid which leaks across said sealing faces from a higher pressure zone to a lower pressure zone and provides limited lubrication and cooling of said faces, the improvement which comprises:

at least one pocket in each of said sealing faces, said pocket in one sealing face being located radially outwardly of the pocket in the other sealing face and exposed to said fluid in said housing and being in intermittent communication with the pocket in the other sealing face located radially inwardly of said pocket in said one sealing face during rotation of said sealing rings and their sealing faces, whereby fluid in a pocket in one sealing face is transferred to a pocket in the other sealing face when said pockets are in communication, said pockets being exposed to the other sealing face at other times, thus providing a radial path for fluid from said higher pressure zone to said lower pressure zone and across said sealing faces to provide improved lubrication and cooling thereof during relative rotation therebetween.

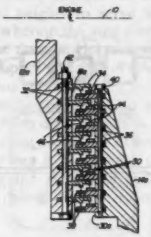
3,957,277

LABYRINTH SEAL STRUCTURE FOR GAS TURBINE ENGINE

Norman G. Margnelli, Berlin, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 10, 1975, Ser. No. 548,863
Int. Cl.² F16J 15/44
U.S. Cl. 277—56 10 Claims

1. A labyrinth sealing structure for use in a gas turbine engine to provide a fluid pressure differential between segregated compartments or sections of the engine comprising spaced rotating and stationary members having facing surfaces, a sealing structure comprising one of said facing surfaces defined by one of said members and having a plurality of spaced annular grooves recessed in said one member and opening in said one facing surface, the other of said members defined by the second of said facing surfaces which is spaced from said first facing surface, annular seal rings supportably received in said grooves and having portions projecting normally beyond said first facing surface, seal elements secured



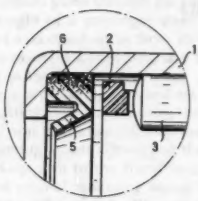
to said projecting portions, spaced annular lands defined adjacent said second facing surface for engagement by said seal elements, and means for releasably retaining said seal rings in said annular grooves.

3,957,278

INJECTION MOLDED SEAL AND PRODUCTION THEREOF

Jurgen Rabe, Herzogenaurach, Germany, assignor to Industriewerk Schaeffler OHG, Herzogenaurach, Germany

Filed Oct. 20, 1972, Ser. No. 299,635
Claims priority, application Germany, Nov. 17, 1971, 2157015
Int. Cl.² F16J 15/32
U.S. Cl. 277—227 2 Claims



1. A seal made of moldable material comprising a sealing lip support integral with a sealing lip bonded together in the hot plastic state, the sealing lip support being made of moldable, fiber-reinforced material and the sealing lip being made of the same moldable material without fiber reinforcement whereby the lip and lip support have different elasticities.

3,957,279

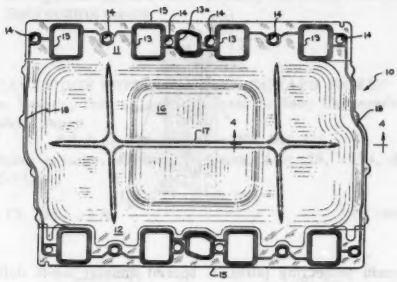
COMPOSITE GASKET ASSEMBLY FOR AN ENGINE

Jerome G. Belter, Mount Prospect, Ill., assignor to Dana Corporation, Toledo, Ohio

Filed Mar. 28, 1975, Ser. No. 563,033
Int. Cl.² F16J 15/12
U.S. Cl. 277—235 B 6 Claims

1. A composite gasket assembly comprising a metallic body including a generally planar portion having a first and second sides, a plurality of apertures in said body, first ribs on said body surrounding and closely spaced from at least some of said apertures and convex with respect to said first side and a layer of relatively soft gasket material on said first side, second ribs on said body surrounding and closely spaced from at least some of said first ribs said second ribs being convex with

respect to said second side of said body, a plurality of tangs formed in said body said tangs being only in areas thereof



remote from said apertures, said tangs being clinched into said soft gasket material thereby securing the same to said body.

3,957,280

SKI BOOT

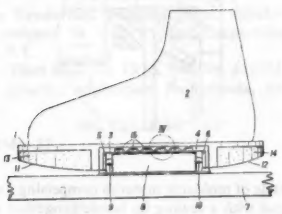
Georg Turnheim, Schwechat, and Axel Kubelka, Vienna, both of Austria, assignors to Gertsch AG, Zug, Switzerland

Filed June 22, 1973, Ser. No. 372,827

Claims priority, application Austria, June 23, 1972, 5403/72

Int. Cl.[2] A63C 9/00

U.S. Cl. 280—613 7 Claims



7. A ski boot construction, comprising:

a sole on said ski boot;

means defining a single recess in the bottom surface of said sole, said single recess extending laterally of the longitudinal direction of said sole at generally the longitudinal central part of said sole and opening outwardly at both sides and entirely along the bottom of said sole leaving only a pair of longitudinally spaced and separate end sole portions, the width of said openings at both sides and along said bottom of said sole being equal to the width of said single recess; and

safety releasable securement means secured to the upper surface of a ski and to said sole in said single recess for releasably holding said ski boot to said ski, said safety releasable securement means providing the only holding connection of said ski boot to said ski.

3,957,281

TENSIONING DEVICE CAPABLE OF DAMPED RETURN MOVEMENT AND RETENSIONING

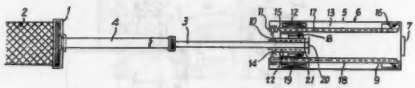
Bernard Marcel Pech, Paris, France, assignor to Societe Nationale des Poudres et Explosifs, France

Filed Mar. 18, 1975, Ser. No. 559,430

Claims priority, application France, Apr. 23, 1974, 74.13980

Int. Cl.[2] B60R 21/10

U.S. Cl. 280—744 8 Claims



1. A tensioning device for use in tensioning an element, such as a vehicle safety belt, comprising a casing, a cylinder having front and rear ends defined within said casing, piston means comprising at least one first piston axially movable within said cylinder, a rod secured to said one piston and having means for attaching said element to be tensioned, an expansion chamber defined between said one piston and said front end of said cylinder, means for supplying gas at high pressure to said expansion chamber to move said one piston in a first direction along said cylinder to exert a tensioning force on the element attached to said rod, piston stopping means actuable in response to said tensioning force reaching a predetermined value to prevent movement of said one piston relative to said cylinder in said first direction but allow movement of said one piston relative to said cylinder in the opposite direction for damping, and means for exerting a tension force on the element attached to said rod at the end of the damping comprising a member which is a part of said cylinder concentric with said piston means and axially slidable relative thereto, and resilient means located between said concentric part and said piston means, said resilient means urging said piston means axially apart from said concentric part, for moving said part in said first direction relative to said piston means, at the end of damping when any external tensioning forces exerted on said rod have been substantially reduced.

3,957,282

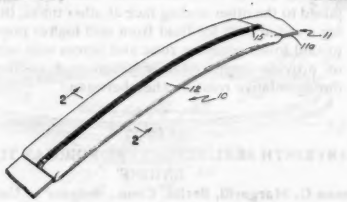
ATTACHMENT FOR A VEHICLE SHOULDER HARNESS

Joseph C. Finnigan, 1204 Allendale Road, McLean, Va. 22101

Filed Dec. 5, 1974, Ser. No. 529,710

Int. Cl.[2] B60R 21/00

U.S. Cl. 280—744 7 Claims



1. A detachable safety device for a motor vehicle that is equipped with a belt of substantial width having opposite edges comprising an attachment for covering the belt adjacent the neck of the user, said covering comprising a unit having a collapsible resilient material of a width substantially greater than the width of the belt and of a thickness greater than the thickness of the belt and folded across and about the edge of the belt and overlapping the opposite side nearest the neck of the user to provide a bight of resilient material about the edge and a covering for said material laterally encircling the belt and provided with a separable closure extending lengthwise of

the belt whereby upon a lateral shifting of the belt the bight of the resilient material about the belt edge may spread to a thickness a multiple of the belt thickness to provide a substantial width for enlarging the area of contact and cushioning the impact of the belt edge with the user.

6. A detachable safety device for a motor vehicle that is equipped with a belt of substantial width having opposite edges comprising an attachment for covering the belt adjacent the neck of the user, said covering comprising a unit having a collapsible resilient material embracing the edge of the belt nearest the neck of the user, said resilient material being of hollow tubular form slit lengthwise and receiving therein the edge of the belt, and a covering for said material laterally encircling the belt and provided with a separable closure extending lengthwise of the belt.

3,957,283

ONE-WAY SPRING LOADED CONNECTOR FOR SINGLE RETRACTOR CONTINUOUS LOOP RESTRAINT SYSTEM

Michael A. Pocobello, Warren, Mich., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Feb. 12, 1975, Ser. No. 549,362
Int. Cl.² B60R *21/00*
U.S. Cl. 280—747 **9 Claims**

1. In a continuous loop restraint system for restraining a person in a vehicle seat including a generally stationary anchor for anchoring one end of a length of webbing to the vehicle, a releasable anchor for releasably anchoring a central portion of the webbing, and a retractor on the vehicle for winding the other end of the webbing therearound so that the portion of the webbing on one side of the releasable anchor is adapted to restrain the pelvis of the person and so that the portion of the webbing on the other side of the releasable anchor is adapted to restrain the upper part of the torso of the person, and wherein said webbing can slide relative to said releasable anchor to allow respective webbing sections to be of a desired length, the improvement comprising the provision of:

drive means adjacent said releasable anchor for urging said webbing through said releasable anchor toward said retractor so that excess webbing is wound about said retractor and so that the portion of webbing between the stationary anchor and the releasable achor is tightened.

3,957,284

MOVABLE STEPS FOR A TRANSIT VEHICLE

Raymond W. Wright, King of Prussia, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Sept. 13, 1974, Ser. No. 505,704
Int. Cl.² B60R *3/02*
U.S. Cl. 280—166 **6 Claims**

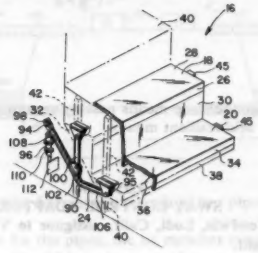
1. Movable steps for use on vehicles to facilitate movement of passengers to or from said vehicle comprising:

a. a frame,

b. a first step member operatively mounted to said frame having a horizontally disposed upper surface,

c. a second step member operatively mounted to said frame having a horizontally disposed upper surface,

d. means operatively associated with said step members for varying the vertical position of said step members between a first position wherein the step members are at different vertical heights to serve as entry stairs, to a second position wherein the step members are both level with the floor of the vehicle to form a platform, while maintaining the upper surfaces of said step members in a horizontal position, comprising a rotatably driven crank member operatively connected to a step member and wherein the rotatably driven crank is driven about its axis through an operating arc which extends from a first position wherein the step is in its down position to a second position wherein the step is in a raised position, said second position being on the opposite side from first position of a vertical plane through the axis so that a force such as the weight of a passenger standing on the step member forces said crank away from its operating arc,



e. linkage means pivotally connecting said first and second step members to the frame comprising:

1. a first linkage arm having first and second ends;

2. pivotal mounting means connecting the first end of the first linkage arm to the second step member;

3. pivotal mounting means connecting the second end of the first linkage arm to the frame such that the pivot point of said pivotal mounting means is permitted to move toward and away from the step members as the step members change vertical positions; and

4. a second linkage arm pivotally connected to said first linkage arm intermediate its ends and pivotally connected to said first step member.

3,957,285

DOUBLE SPRING CARGO TIE-DOWN

Gary D. Schlaeger, Columbia Heights, Minn., assignor to Burlington Northern, Inc., St. Paul, Minn.

Filed Nov. 20, 1974, Ser. No. 525,559
Int. Cl.² B60P *7/08*
U.S. Cl. 280—179 A **4 Claims**

1. In combination:

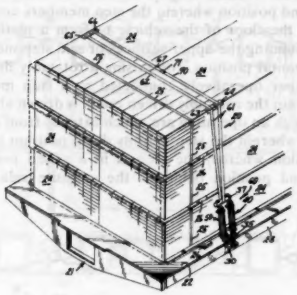
a cross member having a longitudinal axis and a medial strap-engaging surface which is cylindrical about said axis;

a tie bar having a medial connection for pivotal movement about an axis generally orthogonal to the axis of said cross member at the center thereof;

first and second resilient members connecting said cross member to said bar at points oppositely spaced from the centers thereof;

together with a vehicle having a flat bed;

means mounted at the edge of said bed to provide a transverse pivot for said tie bar;



and tensioned strap means passing around said member to stress said resilient means.

3,957,286

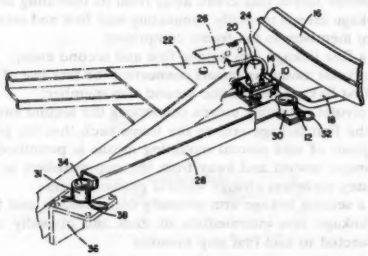
SWAY CONTROL ADAPTOR

Max E. Goodwin, Lodi, Calif., assignor to Valley Tow-Rite, Lodi, Calif.

Filed Feb. 28, 1975, Ser. No. 554,297

Int. Cl.² B60D *1/00*

U.S. Cl. 280—446 B **6 Claims**



1. Apparatus for mounting one end of a sway control assembly to a towing vehicle adjacent the trailer hitch, said apparatus comprising:

an upper elongate member having a first section adapted to overlie a portion of the trailer hitch and a second section extending transversely from the first section, said second section including a vertically disposed aperture for mounting a sway control hitch ball thereto;

a lower elongate member adapted to underlie said portion of the trailer hitch, said lower elongate member including flange means adapted to at least partially circumscribe said portion of the trailer hitch to restrict movement of the upper and lower members with respect to said hitch; and

means for interconnecting the first section of the upper elongate member with the lower elongate member to compress said portion of the trailer hitch therebetween to mount the members to said hitch.

3,957,287

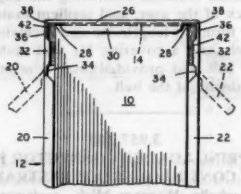
BOOK AND COVER THEREFOR

Lewis William Hall, Lancaster, and Joseph E. Wisotzkey, York, both of Pa., assignors to The Maple Press Company, York, Pa.

Continuation-in-part of Ser. No. 196,101, Nov. 5, 1971, abandoned. This application June 7, 1972, Ser. No. 260,356

Int. Cl.² B42D *1/04, 3/00*

U.S. Cl. 281—21 R **8 Claims**



1. A unitary book cover formed from synthetic resin and adapted to be affixed to a book to cover the spine and provide hinged cover panels for books of different thicknesses within predetermined limits, said unitary cover being sheet-like and comprising cover panels of uniform thickness positioned at opposite ends of said cover and the inner edges of said cover panels being spaced apart by connecting means including a central intermediate back panel which is substantially thinner than said cover panels to render said back panel readily flexible to conform it for connection by adhesive to the spine of a book, said back panel having a width equal to the width of the thickest book of a limited range of thicknesses to which said cover is adapted to be affixed, the outermost portions of said back panel comprising lands and the thinness of said back panel adapting said lands thereby to be bent readily around the edges of books of less thickness than the width of said back panel so as to adapt said lands to be affixed by adhesive to limited portions of the outer pages of said book adjacent the spine thereof and thereby minimize the numbers of different sizes of covers necessary to be made to provide covers respectively for books of a limited range of thicknesses, the flexibility of said back panel also being great enough to minimize memory in said back panel to obviate tendencies to cause said land portions thereof when overlying sides of said book to open said book unintentionally, a portion of said connecting means immediately adjacent the inner edges of said cover panels being thinner than said cover panels and comprising hinge means for said cover panels, and headbands formed of the same material as said back panel and integral therewith adjacent opposite ends thereof on the surface to be affixed to the spine of the book, said headbands being substantially thicker than said back panel and shorter than the width of said back panel and the distance between the inner faces of said headbands being substantially equal to the length of the spine of said book and operable to interposition the spine of said book upon said cover accurately between said headbands when assembling the same.

3,957,288

THERMOGRAPHIC RECORDING MATERIAL

Raymond Gerard Lemahieu, Mortsel; Wilhelmus Janssens, Aarschot, and Daniel Alois Claeys, Mortsel, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Dec. 27, 1973, Ser. No. 428,688

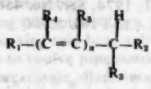
Claims priority, application United Kingdom, Dec. 28, 1972, 59842/70

Int. Cl.² B32B *27/36;* B41B *5/18*

U.S. Cl. 282—27.5 **28 Claims**

1. A thermographic recording process in which a methine dye is produced by bringing image-wise into reactive contact while heating to a temperature of at least about 60°C an acid compound having a pKa of about 2–5 with a dye precursor

compound corresponding to the following general formula and capable of reacting with said acid compound to form a methine dye:



wherein:

R_1 represents an alkoxy substituted phenyl group, an indolyl group, a thienyl group, a carbazolyl group or a pyrrolyl group;

R_2 represents an alkoxy substituted aryl group, an indolyl group, a thienyl group, a carbazolyl group or a pyrrolyl group,

R_3 represents hydroxyl, alkoxy, or

wherein each of R_8 and R_9 (same or different) represents hydrogen or an alkyl group or R_8 and R_9 together represent the necessary atoms to close a N-morpholinyl nucleus or N-piperidyl nucleus;

each of R_4 and R_5 represents hydrogen, or R_4 represents phenyl and R_5 hydrogen; and

n is 0 or 1.

3,957,289

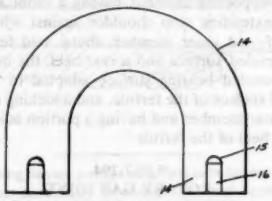
SOLDERED JOINT AND METHOD

Colin H. Kilgore, New Kensington, and Norman P. Wolff, Pittsburgh, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 19, 1974, Ser. No. 498,704

Int. Cl.² F16L *13/08*; B23K *31/02*

U.S. Cl. 285—22 **10 Claims**



1. A hollow tubular member having an outer surface and a terminal end and an adjacent portion adapted to be telescopically received in close fitting relationship in a cup portion of another member prior to a soldering operation,

a nib depending from and projecting outwardly from said surface at a location spaced apart from said end, and

a groove in said outer surface extending longitudinally of said member between said nib and said end and providing a vent passageway for hot gases during a soldering operation while said tubular member is telescopically received in said cup portion.

7. A method of joining metal tubes comprising

providing a female metal tube member having a flared cup end portion,

providing a male metal tube member having a distal end adapted to be received by said cup portion and to seat against an inner surface of said flared cup portion,

forming a plurality of nibs spaced apart circumferentially on the outer surface of said male member and spaced apart from said distal end thereof, and also forming at least one groove on said outer surface and extending longitudinally of said male member between said distal end and one of said nibs,

bringing said distal end into aligned telescoping engagement within said cup portion with said nibs in interference fit engagement with the interior wall surface of said cup portion to provide a frictionally secured joint,

flowing molten filler alloy into said cup portion, and thereafter solidifying said alloy.

3,957,290

FLEXIBLE PIPE JOINTS

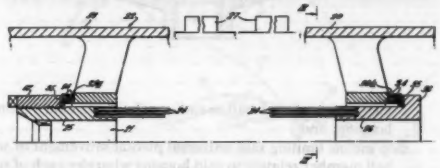
Colin Robert Whitby, and John Richardson, both of Warrington, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 13, 1974, Ser. No. 497,067

Claims priority, application United Kingdom, Sept. 21, 1973, 44469/73

Int. Cl.² F16L *27/00*

U.S. Cl. 285—114 **3 Claims**



1. A flexible joint for joining the ends of two pipes, the joint comprising:

a tie member for the pipes, the tie member consisting of a generally cylindrical component of openwork structure and comprising a plurality of annular series of parallel tie bars extensing between two parallel annular end fittings, the series being co-axial with the longitudinal axis of the component and the ends of the bars being secured to the end fittings with ends encastre,

an expansible sleeve for sealingly connecting the pipes and enveloping the tie member, the expansible sleeve having rigid tubular end pieces for engaging the ends of the pipes, the end pieces presenting abutments to the annular end fittings of the tie member, and

adjusting means complementary to the end fittings of the tie member and the abutments for tensioning the tie member and enabling the tie member to be installed in a pipe line with its axis inclined to the axis of one end piece.

3,957,291

BALL JOINT ASSEMBLY WITH INTERNAL PASSAGES

Porter R. Edling, Houston, Tex.; Robert K. Jefferies, Reston, Va., and Joseph T. Shelton, Houston, Tex., assignors to The Offshore Company, Houston, Tex.

Filed Jan. 10, 1975, Ser. No. 540,000

Int. Cl.² F16L *39/00*

U.S. Cl. 285—136 **7 Claims**

1. A marine riser ball joint assembly to connect a marine riser with a lower element comprising:

a ball member having a generally tubular stem portion and having a ball portion formed on one end of the stem portion,

a generally spherical outer surface on said ball portion,

a retainer housing surrounding said ball portion,

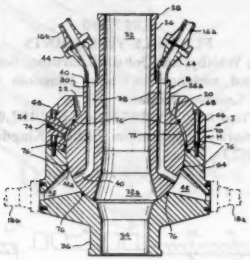
an inner seating surface in said retainer housing,

engaging outer spherical surface of said ball member ball portion permitting universal pivotal movement of said ball member relative to said retainer housing,

said ball member having a plurality of passages extending therethrough from one end of said ball member exterior of said housing to the exterior surface of said ball portion interior of said housing,

said retainer housing having a plurality of passageways extending through its walls and opening at said inner seating surface,

at least one of said passages and passageways in each pair having a flared end portion for maintaining fluid communication between the end of said passages interior of said housing and said passageways during said universal pivitol



movement of said ball member relative to said retainer housing, and

stop means limiting said universal pivotal movement of said ball member relative to said housing whereby each of said passageways communicates with one and only one of said passages in all positions of said ball member relative to said housing.

3,957,292

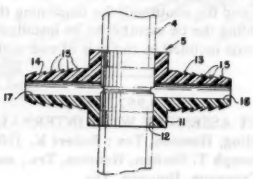
QUICK-CONNECT FITTINGS FOR A TRICKLE TYPE IRRIGATION SYSTEM

Richard E. Diggs, 210 N. River St., P. O. Box 776, Carthage, Mo. 64836

Division of Ser. No. 213,927, Dec. 30, 1971. This application Aug. 16, 1974, Ser. No. 498,210

Int. Cl.[2] F16L *41/00*

U.S. Cl. 285—150 1 Claim



1. A one-piece, plastic, quick-connect fitting for joining together in fluid flow relationship at least two conduits, said fitting comprising a cylindrical body having an axial bore therethrough opening through opposite ends thereof, a pair of diametrically opposite, conically tapered projections extending outwardly from opposite sides of the body intermediate the ends thereof, each of said projections having a serrated outer surface extending over substantially the entire length thereof, a bore extending axially through each projection and communicating with the bore through the body, the bores in the projections being of the same size and being smaller in diameter than the bore through the body, a conduit end received coaxially inside each end of the bore through the body and in snug fitting engagement therewith, and a conduit end received coaxially over the serrated surface of each projection and in snug fitting engagement therewith.

3,957,293

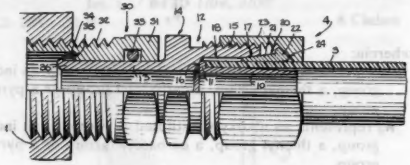
AIR HOSE

Frank J. Rodgers, Fanwood, N.J., assignor to Nycoil Company, Fanwood, N.J.

Filed Apr. 1, 1974, Ser. No. 456,628

Int. Cl.[2] F16L *55/00*

U.S. Cl. 285—174 8 Claims



1. A swivel fitting comprising a hollow outer member and a hollow inner member, the inner member having a portion extending from one end and mounted within the outer member, a locking element means on said portion and cooperating with said outer member to hold the two members together, said outer member being countersunk to provide an internal shoulder, said locking element means on said inner member comprising an outwardly extending lip and a locking member interposed between said internal shoulder and lip cooperating with said shoulder to hold the two elements together, a seal between said inner and outer members and in direct contact with both, said outer member being provided with a circular channel to accommodate said seal, the inner surface of the outer member and the outer surface of the inwardly extending portion of the inner member between said locking element and said seal being elongated and in substantial contact with each other to prevent the two from wobbling relative to each other, said inner member having a hose clamping mechanism extending from the other end which comprises an inwardly tapered inner supporting element and an outer ferrule adapted to hold a hose therebetween, said inner supporting element having an outwardly extending stop shoulder, said inner member having a stop shoulder and the inner supporting element having a front stop on said outwardly extending stop shoulder against which the stop shoulder of said inner member abuts, said ferrule having an outer beveled surface and a rear heel, the inner member having a beveled bearing surface adapted to bear against the beveled surface of the ferrule, and a locking nut mounted over the outer member and having a portion adapted to bear against the heel of the ferrule.

3,957,294

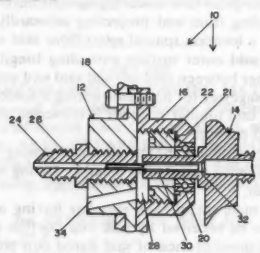
ROTARY GAS JOINT

Fay A. Hoban, China Lake, and Edwin M. Allen, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 6, 1974, Ser. No. 476,958

Int. Cl.[2] F16L *27/00*

U.S. Cl. 285—276 1 Claim



1. In a conduit for passing gas along the axis of rotation between two relatively revolvable members, the combination comprising:

a spindle having an inner centrally located bore, and said spindle being fixedly and rigidly secured to one of said revolvable members;

a cylindrical pipe fixedly and rigidly secured to the other said revolvable member;

said pipe entering said spindle bore, and coaxially and coextensively occupying said bore a distance within the range of from eight to twelve pipe outside diameters;

said spindle bore inside diameter and said pipe outside diameter being selected to produce a diametral clearance within the range of from 0.0002 inch to 0.0005 inch between the outside surface of said pipe and the bore surface of said spindle over said coextensive length;

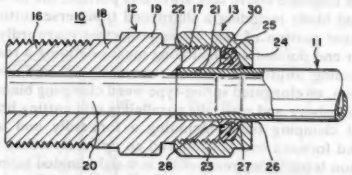
and means for maintaining said pipe in concentric, coaxial alignment with said spindle bore for preventing frictional torque caused by said pipe outside surface contacting said spindle bore surface while said revolvable members are rotating relative to one another.

3,957,295

PIPE COUPLING SEAL

William Gould, and Charna Gould, both of Millburn, N.J., assignors to Nyltite Corporation of America, S. Plainfield, N.J.

Filed Jan. 31, 1975, Ser. No. 545,997
Int. Cl.² F16L *19/00*
U.S. Cl. 285—342 **5 Claims**



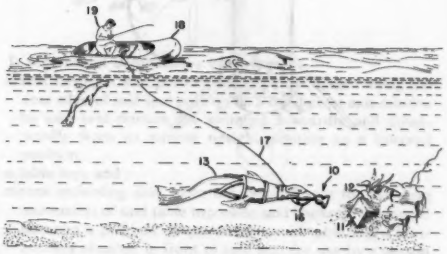
1. A coupling device comprising first tubular coupling member having an externally threaded first end section with an annular end face and a peripheral shoulder formed in the inside face thereof spaced inwardly of and facing in the direction of said annular end face, an internally threaded second tubular coupling member threadedly engaging said first coupling member threaded section and having an annular shoulder confronting said annular end face and delineating therewith an annular recess, an annular sealing member nesting in said recess and formed of a cold flowable polymeric resin and having an initial shape including an inner tubular body section and a reversely directed outer end flange forming an end cuff on said body section, and a pipe, coaxial with and projecting through said second coupling member and sealing member into said first coupling member member and in abutment with said peripheral shoulder, said pipe having a peripheral groove formed in its outer surface disposed substantially axially outwardly of said annular end face in response to said coupling members being screw tightened to longitudinally compress and to deform said sealing member to a shape dissimilar from its inital shape and radially expand it into tight engagement with said peripheral groove of said pipe and the inside face of said second coupling member and substantially fill the cavity defined by said annular end face, annular shoulder, and pipe outside face.

3,957,296

VACUUM MULTIPLIER

Arthur F. Langguth, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1975, Ser. No. 574,786
Int. Cl.² B66C *1/02*
U.S. Cl. 294—66 R **9 Claims**



1. An apparatus for securing a line to a surface comprising:

means for flexibly enclosing a cavity having a mouth communicating therewith;

means carried on the mouth of said cavity for pliably accommodating said surface in a sealed relationship;

means carried in the cavity for urging the flexibly enclosing means to enlarge said cavity;

means holding the urging means for releasing the urging means and enlarging said cavity when said surface is contacted and the releasing means is displaced thereby to pull the pliably accommodating means against said surface thereby securing the line thereto;

means mounted on the flexibly enclosing means for forcing the pliably accomodating means against said surface and displacing the releasing means; and

means reaching across the mouth of said cavity for positioning the releasing means with respect to the pliably accommodating means to ensure the displacement of the releasing means after the pliably accommodating means has contacted said surface.

3,957,297

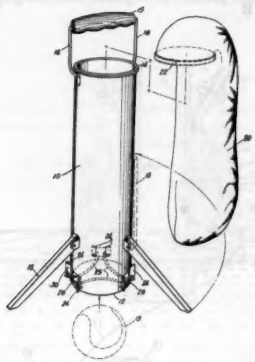
TENNIS BALL RETRIEVER

William J. Hanks, Box 92594, Morris Brown Station, Atlanta, Ga. 30314

Filed July 18, 1974, Ser. No. 489,575
Int. Cl.² A63B *47/02*
U.S. Cl. 294—19 A **6 Claims**

1. A ball retriever comprising a tube having a pair of spaced slots, an inlet through which a ball may pass into the tube, and a pair of tabs formed unitarily with said tube and projecting outwardly therefrom adjacent said slots; at least one arcuate arm pivotally mounted to said pair of tube tabs adjacent said inlet for movement between positions of greater and lesser

proximity to the interior walls of said tube and with said arm being spring biased towards said position of lesser proximity;



and stop means for stopping said arm at said position of lesser proximity.

3,957,298

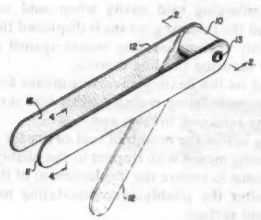
TOAST TONGS

Herbert K. Purchase, 5550 Columbia Pike, Apt. 641, Arlington, Va. 22204

Filed Dec. 3, 1974, Ser. No. 529,227

Int. Cl.² A47G *21/10*; A47J *43/28*

U.S. Cl. 294—33 **3 Claims**



1. Tongs including a block-like finger spacing and mounting member, a pair of tong fingers having substantially plane inner and outer faces extending throughout the lengths thereof, means for fixedly securing one end of one of said fingers to a side of said spacing and mounting member, means for tightly mounting one end of the other of said fingers on the opposite side of said spacing and mounting member spaced from and rotatable substantially parallel to said one finger, said fingers being formed of thin insulating material and being substantially rigid transversely thereof in the planes of the inner faces and flexible at right angles thereto, and at least one of said fingers having a roughened surface on a substantial portion of the inner face thereof exclusive of the part which engages said spacing and mounting member.

3,957,299

WEEDING TOOL

James P. Johnson, and Virgie M. Johnson, both of 214 N. Tonica, Mason City, Ill. 62664

Filed Feb. 21, 1975, Ser. No. 551,970

Int. Cl.² A01B *1/16*

U.S. Cl. 294—50.9 **4 Claims**

1. A weeding tool including a generally vertical operating shank including front and rear sides and a lower end portion slightly rearwardly inclined, a substantially straight elongated cutting blade rigidly mounted on the lower end of said lower end portion with said blade disposed at substantially right angles relative to said lower end portion and extending in a front to rear direction so as to be slightly forwardly and downwardly inclined relative to the upper portion of said operating shank disposed above said lower end portion, the forward end of said blade including a sharpened transverse cutting edge, the rear portion of said blade projecting rearwardly of said lower end portion and including means defining a rearwardly projecting abutment spaced rearwardly of said lower end portion, an elongated spring-type weed clamping blade closely spaced above and generally paralleling said cutting blade, said weed clamping blade including a forwardly and upwardly angled forward end portion and an upwardly offset rear end portion terminating rearwardly in a right angled terminal end overlying and rigidly secured to the front side of the lower end portion of said operating shank.

3,957,300

TIRE HANDLING DEVICE

Arthur David Tippin, Tamworth, England, assignor to Dunlop Limited, London, England

Filed July 2, 1974, Ser. No. 485,168

Claims priority, application United Kingdom, July 12, 1973, 33222/73

Int. Cl.² B66C *1/00*

U.S. Cl. 294—97 **6 Claims**

1. A tire handling device comprising:

a plurality of paddle members,

an annular mounting to which the paddle members are pivotally connected near to one of the respective ends thereof so that when the mounting is horizontal the paddle members depending from it will jointly form an open-ended, generally cylindrical enclosure,

each of said paddle members comprises, adjacent said one end, an arm extending radially outwardly of the enclosure,

the annular mounting comprises a ring which is pivotally connected to each paddle member at a point thereon near the root of its arm,

suspension means for the device adapted to engage each said paddle member at a position offset radially outwardly

of the enclosure from the pivotal connection of each of the paddle members to the annular mounting when the device is lifted by said suspension means whereby the other ends of the paddle members tend to move radially outwardly of the enclosure under the action of gravity,

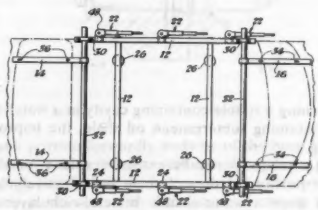
and the suspension means comprises a second outer ring connected by suitable linkage means to the first-mentioned ring for relative axial movement, thereby to engage the free end of the arm of each paddle member when the device is lifted.

3,957,301

VEHICLE SUN SHADE

Frank J. Huber, 6840 SW. 8th St., Apt. F613, Miami, Fla. 33139

Filed Mar. 3, 1975, Ser. No. 554,754
Int. Cl.² B60J *3/00*
U.S. Cl. 296—95 R **3 Claims**



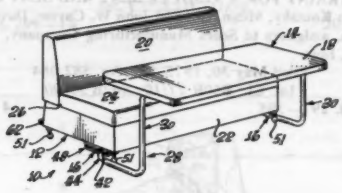
1. A sun shade mountable on a vehicle roof comprising:
a rectangular frame, said frame including a front bar and a parallel opposite rear bar and a pair of side bars perpendicularly connected to said front and rear bars;
a plurality of roof mounted support means connected to said rectangular frame;
means connected to said frame for adjustably connecting and tensioning said frame to said vehicle roof;
a first pair of supporting arms connected to said front bar of said frame, said supporting arms being rotatable from a first position extended outwardly from said frame to a second position within said frame;
a second pair of supporting arms connected to the rear bar of said frame, said second pair of supporting arms being rotatable and lockable from a first position extending outwardly of said frame to a second position within said frame;
a plurality of side supporting arms rotatably coupled to said side bars of said frame, said side supporting arms moveable and lockable from a first position in the plane of said frame perpendicular to said side bars to a second position in the plane of said frame parallel to said side bars; and
a flexible sun shading means connected to said first, said second and said side supporting arms.

3,957,302

FURNITURE COMBINATION

Ferris E. Jones, 943 Millbury Ave., La Puente, Calif. 91746

Filed Apr. 21, 1975, Ser. No. 569,791
Int. Cl.² A47B *85/04*
U.S. Cl. 297—126 **10 Claims**



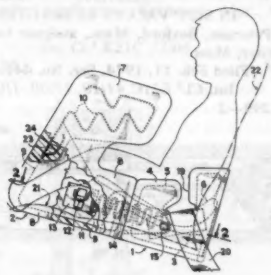
1. A furniture combination comprising:
a seat having a seat portion and backrest hinged along the rear edge of said seat portion on a fixed pivot axis relative to said seat portion for swinging forwardly and downwardly from its normal upright position to a lowered position,
a table top, and
means mounting said table top on said seat for swinging movement of said table top when said backrest is lowered between a position of use wherein said table top is horizontally situated in front of said seat for use by a person occupying the seat and a storage position wherein said table top is situated in an edgewise upright altitude behind said backrest and for fore and aft edgewise adjustment of said top relative to said seat in said use position of said top.

3,957,303

SAFETY SEAT FOR A CHILD

Gerard Mauron, Versailles, France, assignor to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Boulogne-Billancourt, both of, France

Filed Apr. 4, 1975, Ser. No. 565,151
Claims priority, application France, Apr. 5, 1974, 74.12146; June 18, 1974, 74.21059; Feb. 27, 1975, 75.06147
Int. Cl.² A62B *35/00*
U.S. Cl. 297—216 **24 Claims**



1. A seat for a child comprising a seating, two side walls having front and rear portions adapted for mutual engagement along a substantial height, a band positioned for thoracic contact during impact, attaching means for attaching the seat to a normal vehicle seat, a front seat part and a rear seat part, energy absorbing and dissipating means interconnecting the front and rear seat parts, the rear seat part including the seating, the attaching means and the rear portion of each side wall, and the front seat part including the band and the front

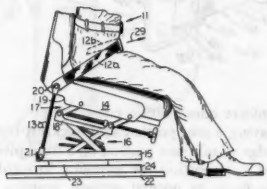
portion of each side wall, the energy absorbing and dissipating means being disposed on each side of the seat between said two portions of the side walls and extending into one of the front and rear portions.

3,957,304

RESTRAINT FOR A VEHICLE SEAT AND SEAT BELT

L. John Koutsky, Milan, Ill., and John W. Carter, Davenport, Iowa, assignors to Sears Manufacturing Company, Davenport, Iowa

Filed May 30, 1975, Ser. No. 582,084
Int. Cl.² B60R 21/10; A62B 35/00
U.S. Cl. 297—385 4 Claims



1. A vehicle seat assemby with a strong flexible restraint tie completely contained therein comprising:

a seat including a seat frame for supporting a horizontal cushion and an upright back, a rugged fore-and-aft adjustment having a fixed member and a movable member, a spring suspension having upper and lower ends, means connecting said lower end to said movable member, means connecting said upper end to said seat frame for suspending said seat frame above said fore-and-aft adjustment, said seat having a normal uppermost position for riding comfort, fastening means for securing said fixed member to rigid structure of a vehicle,

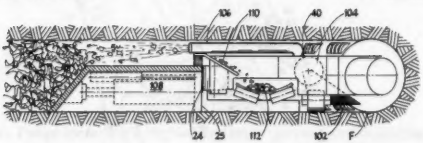
said strong flexible restraint tie having one end connected to said seat frame and its other end connected to said movable member, the ends of said tie being secured at points approximately in a vertical line with said back, the length of said tie being such that said tie becomes taut in said normal uppermost position of said seat frame, and a seat belt connected to said seat frame.

3,957,305

IN SITU VALUES EXTRACTION

Carl R. Peterson, Boxford, Mass., assignor to Rapidex, Inc., Gloucester, Mass.

Filed Feb. 11, 1974, Ser. No. 441,433
Int. Cl.² E21C 41/10, 17/00, 1/02
U.S. Cl. 299—2 11 Claims



1. The method of in situ extraction of a constituent of a rock formation comprising breaking the rock in situ in a manner to form a series of adjacent, narrow, flow-directing chambers in the rock filled with fluid-permeable broken rock, producing a flow through a first of said chambers of liberating fluid, venting spent liberating fluid which passes through said first chamber out of an exit and through a second said chamber while collecting said constituent from said first chamber, and iterating said steps by producing a flow through said second chamber of liberating fluid in the direction opposite from the venting flow during prior venting through said second chamber, and venting spent liberating fluid which passes through said second chamber through a third said chamber while collecting said constituent from said second chamber, and wherein the zone of liberating action of said liberating fluid is caused to progress from entry to exit of said first chamber, said liberated fluid being comprised at least in part of a condensable fluid, during the advance of the liberating action said condensable part condensing upon rock in said first chamber downstream of said zone of action, and during a stage of said liberating action near the exit of said first chamber said condensable part being carried with the venting fluid and condensing upon rock in said second chamber and thereafter during said iteration while directing a stream of liberating fluid in the direction opposite of the venting direction through said second chamber, collecting at the lower portion of said second chamber condensate liberated previously from said first chamber and condensed in said second chamber.

3,957,306

EXPLOSIVE-AIDED OIL SHALE CAVITY FORMATION

Philip J. Closmann, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed June 12, 1975, Ser. No. 586,320
Int. Cl.² E21B 43/24, 43/26
U.S. Cl. 299—4 6 Claims

1. In forming a rubble-containing cavity in a water-soluble-mineral-containing subterranean oil shale, the improvement comprising:

forming a relatively areally extensive void in or above an upper portion of the oil shale by selectively leaching solids from a water-soluble mineral-rich layer in that location;

forming a relatively areally extensive permeable zone or void in or continguous with a lower portion of the oil shale by selectively leaching solids from a water-soluble mineral-rich layer in that location;

displacing explosive liquid into the lower void or permeable zone;

displacing fluid having a relatively low density and high compressibility into the upper void; and

subsequently, detonating the explosive to fragment the adjacent shale by the combined action of direct and reflected shock waves and solids-displacement.

3,957,307

ROUGH CUTTER MINING TOOL

Olind Varda, 23325 Blackstone, Warren, Mich. 48089

Filed Sept. 18, 1974, Ser. No. 507,007
Int. Cl.² E21L 35/18
U.S. Cl. 299—86 2 Claims

1. A rotary mining tool comprising:

a unitary bit support lug consisting of a metal block having a substantially planar forward face and terminating in a substantially planar rear face, there being no block support structure extending beyond the rear face, an open ended cylindrically shaped bore extending through the

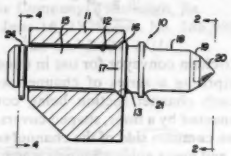
lug from the forward face to the rear face, with the open bore ends forming forward and rear end portions, said forward end portion including a forwardly facing tapered countersink;

a cutter bit formed of an elongated, cylindrically shaped shank portion and an elongated head portion, with an integral annular ring-like shoulder formed on the bit between the shank and head portions, the shoulder having a rearwardly facing tapered surface substantially conjugate with the tapered countersink;

a cutter point secured on the terminal end portion of the elongated head of the bit;

the shank portion being loosely fitted within the lug bore with the tapered shoulder normally engaging the tapered countersink for centering the bit relative to the bore and with the cutter head portion extending forwardly of the bore forward end portion, and with the free end of the shank portion extending rearwardly beyond the bore rear end portion and the terminal rear face of the unitary lug;

non-biasing retaining means including a clip mounted in an annular groove formed in the free end of the shank portion for engaging the lug at the bore rear end portion, said clip being comprised of a springy wire bent into an open ring-like, roughly U-shaped form, frictionally fitted within said annular groove with the wire extending radially outwardly of the groove for engaging the lug at the bore rear end portion, and with opposite ends of said wire being bent into legs extending approximately radially outwardly of the shank for engaging the lug portion adjacent to the wire wherein the wire may be removed for removing the



shank portion forwardly endwise of the bore for replacement of the cutter bit, said annular groove being only slightly larger than the clip so that the clip will be accurately positioned, with the distance between the groove and forward-most portion of the ring-like shoulder being greater, but only slightly greater, than the distance between the forward and rear lug faces to permit limited unrestricted axial endwise movement of the shank portion relative to the bore, the retaining means being normally spaced a short distance rearwardly of the bore rear end portion and the lug rear face;

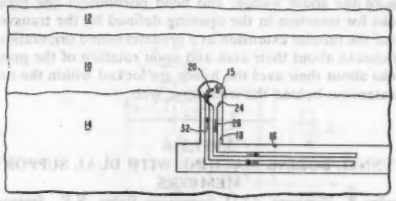
the shank portion being of a considerably smaller diameter than the bore diameter wherein the surface of the shank portion is normally spaced from the bore surface and the shank portion may freely rotate within and may move sidewise relative to the bore, and said shank having a continuous, uninterrupted cylindrical surface between the groove and the tapered shoulder and further, the ratio of: (A) the difference between the diameter of the bore and the diameter of the shank to (B) the diameter of the bore, being substantially about 1:50;

wherein small sand-like particles entering the bore forward end portion will pass between the adjacent cylindrical shank and bore surfaces and out of the bore rear end portion around the non-biasing retaining means, with such passage facilitated by unbiased relative movement between the shank portion and bore resulting from disengagement of the tapered surfaces of the shank shoulder and the lug countersink as limited by the clip retaining means engaging the lug rear face.

3,957,308
METHOD OF REMOVING TAR SANDS FROM SUBTERRANEAN FORMATIONS

Charles A. R. Lambly, 32 Essex Court, Alamo, Calif. 94507, and Charles T. Draney, 275 Pinehill Road, Hillsborough, Calif. 94010

Filed Nov. 8, 1974, Ser. No. 522,197
Int. Cl.² E21C *41/10*
U.S. Cl. 299—14 **20 Claims**

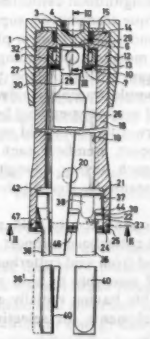


14. A method of mining a subterranean tar sands formation comprising: forming a plurality of tunnels below said tar sands formation and an opening for each of a number of cavities in the formation, respectively, each opening extending from a corresponding tunnel to a respective cavity; directing a flow of water along paths extending through certain of said tunnels and said openings and wetting the exposed surfaces of the tar sands formation for a time sufficient to permit water to permeate the tar sands formations, causing it to spall and the spalled material to fall into the corresponding cavities, whereby said cavities will be enlarged to present newly exposed tar sands surfaces; wetting the newly exposed surfaces of the formation and of the spalled material, whereby water will penetrate said newly exposed surfaces to cause further spalling; wetting the spalled material until it has substantially disintegrated into loosened tar sands; and removing the loosened tar sands from each cavity in the form of a slurry by gravity flow during the wetting steps.

3,957,309
APPARATUS FOR MECHANICALLY BREAKING UP ROCK

Helmut Darda, Im Tal, 7712 Blumberg, Germany

Filed Mar. 6, 1974, Ser. No. 448,568
Claims priority, application Germany, Mar. 9, 1973, 2311723
Int. Cl.² E21C *37/06*
U.S. Cl. 299—22 **13 Claims**



1. Apparatus for mechanically breaking up rock comprising a hydraulic piston-cylinder assembly, a tubular extension projecting from the cylinder of the piston-cylinder assembly,

a web extending transversely within the outer end of the tubular extension to define an elongate opening, a piston rod extending from the piston of the piston-cylinder assembly, a slider wedge which has convergently inclined bearing surfaces and is reciprocable within the tubular extension by the piston rod said slider wedge being releasably and pivotably connected to said piston rod, presser cheeks which are releasably mounted for lateral movement within the tubular extension and have bearing surfaces for complementary engagement with the convergently inclined bearing surfaces on opposite sides of the slider wedge, and head portions of the presser cheeks for insertion in the opening defined by the transverse web of the tubular extension at a predetermined orientation of said cheeks about their axes and upon rotation of the presser cheeks about their axes the heads are locked within the tubular extension behind the transverse web.

3,957,310

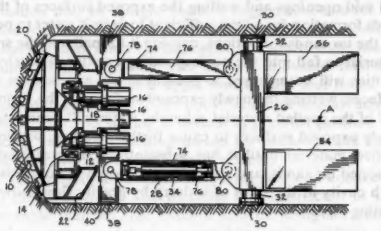
TUNNEL BORING MACHINE WITH DUAL SUPPORT MEMBERS

Douglas F. Winberg, 1171 Sycamore Drive, S.E., Issaquah, Wash. 98027, and Norman D. Dyer, 5825 Pinkstaff Lane, Beaumont, Tex. 77706

Filed Jan. 2, 1974, Ser. No. 430,191

Int. Cl.[2] E21D *9/00*; E01G *3/04*

U.S. Cl. 299—31 **13 Claims**



1. A tunnel boring machine for progressively boring a tunnel while disposed therein, said machine comprising:

a rotary cutterhead assembly having cutting means mounted on a forward face thereof for engaging the end wall of said tunnel;

a cutterhead support assembly located generally rearwardly of said cutterhead assembly and on which said cutterhead assembly is mounted for rotation about an axis generally coincident with a longitudinal centerline of said tunnel;

a pair of elongate torque transmitting support members on opposite sides of and spaced from a plane through said axis, said support members precluding a longitudinally extending main beam on said plane through said axis which main beam would transmit a substantial amount of torque, each of said support members being connected to and extending rearwardly from said cutterhead support assembly, said support members each having a torque reaction end and each having a longitudinal centerline which remains substantially straight during operation of said machine;

a gripper assembly connected to said support members rearwardly of said cutterhead support assembly so that torque is transmitted from said cutterhead support assembly to said gripper assembly by said support members, said gripper assembly having radially extensible and retractable gripper elements for selectively gripping the walls of said tunnel;

means associated with each of said torque reaction ends to prevent pivotal movement of its respective support member about said torque reaction end, relative to the connected assembly of said machine, in a plane substantially perpendicular to a plane generally defined by said support members;

means associated with said support members permitting limited relative longitudinal movement between said cutterhead support assembly and said gripper assembly; and

drive means associated with said cutterhead support assembly and said gripper assembly and operative to cause relative longitudinal movement between said cutterhead support assembly and said gripper assembly.

3,957,311

SCRAPER CHAIN CONVEYOR WITH VENTILATION PARTS

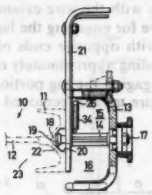
Wulff Rösler, Altlunen, and Christoph Rassmann, Lunen, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westphalia, Germany

Filed Apr. 30, 1975, Ser. No. 572,967

Claims priority, application Germany, June 7, 1974, 2427555

Int. Cl.[2] E21C *35/20*

U.S. Cl. 299—43 **15 Claims**



1. A scraper-chain conveyor for use in mineral mining, said conveyor comprising a series of channel sections arranged end-to-end, each channel section being composed of side walls interconnected by a floor, shaped covers and spacer bars attached to one common side of the channel sections to define thereat upper and lower guide channels which serve to receive a drive chain for a machine guided for movement along the conveyor, vents in said one common side of the channel sections for permitting any accumulated gas to pass from the region from beneath the floors of the channel sections to the upper chain guide channel for subsequent escape therefrom and guard plates for shielding the vents whereby to inhibit the vents from becoming blocked by the ingress of material while permitting the passage of the gas to said upper guide channel.

3,957,312

VEHICLE SEAT HAVING A SWINGABLE BACKREST

Michel Bonnaud, Montbeliard, France, assignor to Automobiles Peugeot, Paris, France

Filed Feb. 3, 1975, Ser. No. 546,777

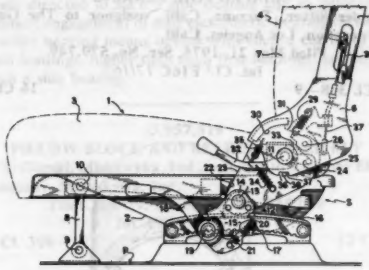
Claims priority, application France, Feb. 20, 1974, 74.05755

Int. Cl.[2] A47C *1/02*

U.S. Cl. 297—341 **4 Claims**

1. In a vehicle seat comprising: a seat base, a backrest, means mounting the backrest relative to the seat base to be pivotable about a first axis, regulating means for regulating the position of the seat base relative to a floor in a direction longitudinally of the seat base, said first axis being transverse to said longitudinal direction, said regulating means including a link which is pivoted adjacent one end of the link to a front part of the seat base and pivoted adjacent an opposite end thereof to the floor, a slideway located in the rear part of the seat base for fixing to the floor and extending longitudinally of the seat base, a shoe slidable along the slideway, means for locking the shoe with respect to the slideway in a selected position, means for mounting the shoe on the seat base including an intermediate member mounted on the seat

base to pivot about said first axis and mounted on the shoe to pivot about a second axis spaced from and paralel to said first axis, first locking and unlocking means for releasably locking the intermediate member relative to the seat base, said back-



rest being pivotally mounted with respect to said intermediate member, a second locking and unlocking means for adjusting the relative angular position between said backrest and said intermediate member.

3,957,313

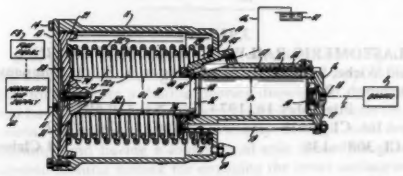
PRESSURE INTENSIFIER UNIT FOR VEHICLE BRAKING SYSTEM

Richard A. Doversberger, Peoria, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.

Filed June 16, 1975, Ser. No. 586,980

Int. Cl.² B60T *13/10*

U.S. Cl. 303—2 **9 Claims**



1. A pressure intensifier unit for a vehicle braking system having a modulated air supply and for controlling application of pressurized hydraulic fluid to a brake of the hydraulic type comprising, in combination, a cylindrical housing having a low pressure cylinder of large diameter and a high pressure cylinder of relatively small diameter joined coaxially end-to-end, a disc-shaped air piston and return spring therefor in the low pressure cylinder, a cylindrical high pressure piston of relatively small diameter in the form of a smoothly surfaced straight-sided post coaxially secured at its base to the air piston and extending into the high pressure cylinder, the high pressure cylinder being filled with hydraulic fluid, the low pressure cylinder having an air inlet for connection to the modulated air supply and the high pressure cylinder having an hydraulic fluid outlet for connection to the brake, an annular gland at the junction between the low pressure and high pressure cylinders, the gland mounting annular sealing elements for surrounding and sealing the cylindrical piston and for isolating the cylinders from one another, the inner diameter of the high pressure cylinder being greater than the diameter of the high pressure piston so that when such piston moves into high pressure cylinder upon application of air to the inlet annular clearance exists around the piston with the hydraulic fluid being volumetrically displaced for discharge at high pressure through the outlet.

3,957,314

DEVICE FOR MONITORING THE FLOW IN THE AIR LINE OF AN AIR BRAKE SYSTEM ON A RAILWAY VEHICLE

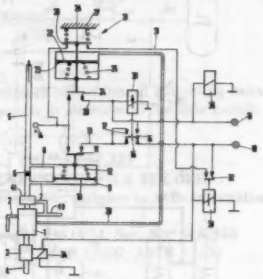
Erich Falke, Munich, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed Nov. 25, 1974, Ser. No. 526,738

Claims priority, application Germany, Nov. 24, 1973, 2358612

Int. Cl.² B60T *13/74*

U.S. Cl. 303—3 **10 Claims**



1. In a device for monitoring the flow in an air line of an air brake system on a railway vehicle, th combination of an air line connected to a source of compressed air and an operator's brake valve therein to control pressure in said air line and movable between brake release and brake applied positions, a restrictor in said air line, pressure sensing means responsive to a pressure drop in said restrictor, a first control line including a first switching means responsive to said pressure sensing means and connected to a source of energy for passing energy therethrough only when a predetermined pressure difference across said restrictor is exceeded, second switching means connected to said first switching means and having a first normally closed position and a second normally open position, means connected to said first position of said second switching means for indicating a brake release, means responsive to an increase in pressure at said operator's brake valve for connecting said second switching means through said first switching means to said source of energy whereby said brake release indicating means is energized only when said operator's brake valve is in the brake release position, and means connected to said normally closed first position of said second switching means for indicating a defect-originated flow of air in the air line when a predetermined pressure drop occurs across said restrictor.

3,957,315

BRAKE CONTROL SYSTEM WITH PROPORTIONAL LOADING OF THE BRAKES DURING RETARDING

Curtis Farris Cummins, Decatur, and Kenneth Wayne Kelly, Warrensburg, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 15, 1974, Ser. No. 524,118

Int. Cl.² B60T *8/26*

U.S. Cl. 303—6 C **12 Claims**

1. A brake control system for a vehicle having at least front and rear sets of wheels to be braked, said system comprising:

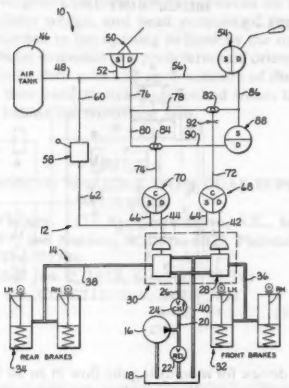
front friction brake means for braking the front wheels of a vehicle and rear friction brake means for braking the rear wheels of a vehicle said front and said rear friction brake means having different energy-dissipating capacities;

a source of pressurized fluid for controlling the application of both of said brake means;

service brake control means for controlling the application of both of said brake means in a first ratio of pressure of said front brake means to said rear brake means for a

normal mode of operation including full application of both of said brake means;

retarding brake control means for controlling the application of said both brake means in a second ratio of pressure between said front brake means to said rear brake means for a retarding mode of operation limited to an intermediate setting of less than full application of both of said brake means; and,



said retarding brake control means includes means for apportioning the pressure of said fluid between said front and rear brake means for controlling the application of both of said brake means in proportion to the energy-dissipating capacity of the respective front and rear brake means.

3,957,316

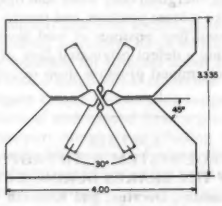
FLEXIBLE PIVOT

Harry J. Armitage, 1546 Cavitt Road, Monroeville, Pa. 15146

Division of Ser. No. 409,314, Oct. 24, 1973, Pat. No. 3,892,090. This application Mar. 27, 1975, Ser. No. 562,660

Int. Cl.[2] F16C *11/12*

U.S. Cl. 308—2 A **11 Claims**



1. A flexible pivot including first and second members, each member having relatively thick rigid end sections integrally joined by a relatively thin central flexible section, and also including first and second blocks, said members and blocks being connected in a flexible assembly with a surface of said first block opposite and generally parallel to a corresponding surface of said second block, the end sections of said first member penetrating into said blocks, each through a said surface of a block, and being secured each in a block transversely to said surfaces between said blocks with the thin section extending between said blocks, and the end sections of said second member penetrating into said blocks each through a said surface of a block and being secured each in a block also transversely to said surfaces between said blocks with its thin section extending between said blocks, the thin section of said first member being displaced with respect, and at an angle, to the thin section of said second member, the intersection of the planes of said thin sections defining a pivotal axis.

3,957,317

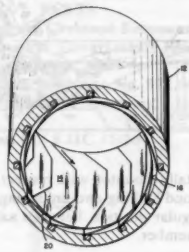
SHAPED FOIL BEARING

Alexander Silver, Tarzana, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed May 21, 1975, Ser. No. 579,749

Int. Cl.[2] F16C *17/16*

U.S. Cl. 308—9 **16 Claims**



1. In combination:

a pair of members arranged for relative rotation with respect to one another, one of said pair of members adapted to rotatively support the other; and

a compliant foil bearing operably disposed between said pair of relatively rotatable members, said compliant foil bearing comprising a plurality of overlapping compliant foils mounted on one of said pair of members and including means at the free ends thereof to induce the flow of fluid across the plurality of foils.

3,957,318

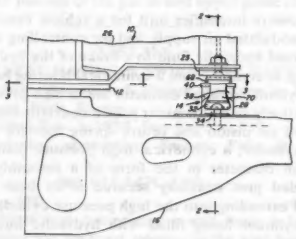
ELASTOMERIC RAILWAY TRUCK SIDE BEARING

Donald Wiebe, Sewickley, Pa., assignor to A. Stuck, Company, Pittsburgh, Pa.

Filed May 16, 1974, Ser. No. 470,607

Int. Cl.[2] B61F *5/14, 5/24;* **F16C** *17/04, 21/00*

U.S. Cl. 308—138 **14 Claims**



1. A railway vehicle side bearing assembly adapted to be disposed intermediate a bolster and car body of a railway vehicle comprising: an elongated upwardly open housing; roller bearing means received within said housing; elastomeric bearing means received within said housing intermediate each axial end of said housing and said roller bearing means; the uppermost surface of said elastomeric bearing means is spaced upwardly from the uppermost surface of said roller bearing means when said elastomeric bearing means is in the uncompressed state thereof and when first loadings are directed to such a side bearing during operation of such a railway vehicle;

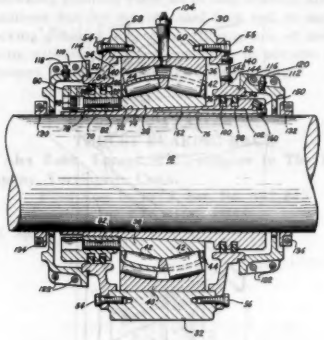
said uppermost surfaces of said roller bearing means and elastomeric bearing means being spaced upwardly from the uppermost surface of said housing; and said elastomeric bearing means being of a configuration and stiffness to engage such a car body and maintain a spacing between said roller bearing means and such a car body and when such first loadings are directed to such a side bearing and to deform such that direct engagement of said elastomeric bearing means and said roller bearing means occurs with such a car body when second loadings, higher than such first loadings, are directed to such a side bearing.

3,957,319

PILLOW BLOCK AND BEARING ASSEMBLY

Paul T. Gorski, Mishawaka, Ind., assignor to Reliance Electric Company, Mishakawa, Ind.

Filed Jan. 29, 1975, Ser. No. 545,028
Int. Cl.² F16C *1/24*
U.S. Cl. 308—187 **12 Claims**



1. A pillow block and bearing assembly comprising a housing having a lubrication chamber therein and opposed openings for receiving a shaft, a bearing disposed in said chamber and having inner and outer races and rolling elements therebetween, an adapter extending axially through said housing openings and having a longitudinal split therethrough and a tapered annular surface for engaging the inner surface of said inner race, a screw means disposed on one end of said adapter engaging said inner race for urging the tapered surface of said adapter into engagement with said inner race, means defining hydraulic fluid passages in said adapter for releasing said adapter from said inner race when said screw means has been loosened, and sealing means at each of said openings in said housing between the housing and adapter for sealing lubricant in said chamber.

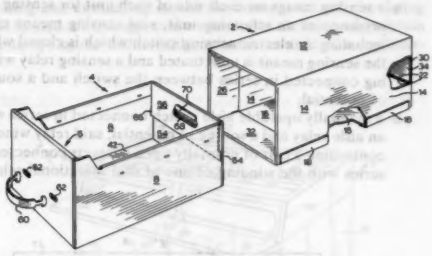
3,957,320

ALL CORRUGATED TRANSFER FILE

Erhard P. Walter, Downsview, Canada, assignor to Oxford Pendaflex Canada Limited, Toronto, Canada

Filed Apr. 22, 1975, Ser. No. 570,442
Int. Cl.² A47B *47/00*
U.S. Cl. 312—108 **8 Claims**

1. A collapsible box file comprising a sleeve portion and a drawer insertable within the sleeve portion wherein both the drawer and the sleeve portion are formed by fold corrugated cardboard blanks, the blank forming the sleeve portion having opposite edges attached to form a tubular sleeve having top, side and bottom panels each with front and rear flaps, the rear flaps being folded into a common plane to close one end of the sleeve, and the front flaps being folded into the interior of the front end of the sleeve to engage one another, those front flaps attached to the side panels being additionally folded upon themselves at least once to form supporting pillars comprising



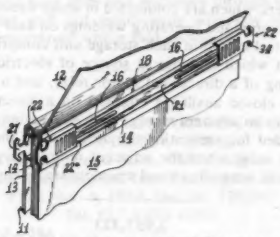
at least two thicknesses of cardboard extending between the top and bottom panels in addition to the side panels.

3,957,321

SUSPENSION FILE FOLDER

Allen J. Rose, Chicago, Ill., assignor to Acco International Inc., Chicago, Ill.

Filed Sept. 23, 1974, Ser. No. 508,520
Int. Cl.² B42F *13/00;* **A47B** *63/00*
U.S. Cl. 312—184 **1 Claim**



1. A hanger hook assembly for a suspension file folder comprising, in combination, an elongated compressor bar, a rail on each longitudinal edge of said bar forming a longitudinal channel between them, said bar having at least two holes one inwardly from each end of the bar, a pair of flexible posts one extended through each of said holes and being bent over inwardly toward each other to lie within the channel, a pair of slide members each having a body including a web portion bridging the channel and slidably engaged with the longitudinal rails, an extension on the outwardly disposed end of each slide-member web portion, said extension comprising a planar narrow-width neck terminating at its outer end in at least one substantially right-angular projection having a free end which angles towards the slide-member web portion thereby to define a hook, stops on the ends of the rails, and blind slots on the under faces of the web portion positioned to receive the stops and thereby limit outward sliding of the slide member.

3,957,322

CONTROL MEANS FOR SELECTIVELY SHIFTING STORAGE UNITS

Pasquale J. Mastronardi, Northfield, and Gary M. Swart, Lincroft, both of N.J., assignors to Estey Corporation, Red Bank, N.J.

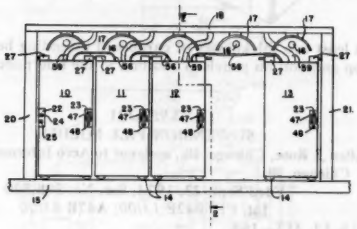
Filed Mar. 6, 1975, Ser. No. 555,820
Int. Cl.² A47B *53/02;* **B61B** *13/12*
U.S. Cl. 312—198 **9 Claims**

1. In a storage array including a plurality of mobile storage units, each unit having a separate motor for movement along a common track in either direction controlled by right and left

directional motor relays to open a desired aisle space between units; the improvement comprising:

a. a sensing means on each side of each unit for sensing the presence of an adjoining unit, said sensing means each including an electric sensing switch which is closed when the sensing means is unactuated and a sensing relay winding connected in series between the switch and a source of potential;

b. a manually operable aisle switch connected in series with an aisle relay and a source of potential, said relay winding controlling a pair of normally open contacts connected in series with the winding of one of said directional relays;



c. said directional relays including three normally open contacts, which are connected in series between a source of potential and operating windings on said motors; and

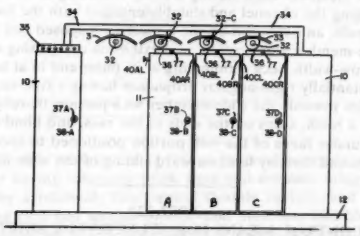
d. a control circuit in each storage unit comprising a series circuit which includes; a source of electric power, the winding of a directional motor relay, and a pair of normally closed auxilliary contacts on a directional motor relay in an adjacent storage unit; said series circuit being provided for preventing the actuation of the directional motor relay when the adjacent motor relay is actuated and said normally closed contacts are opened.

3,957,323

STORAGE MEANS WITH SEQUENTIALLY SHIFTABLE UNITS

Frank Philip Tucker, Oceanport, and Sherburn M. Becker, III, Little Silver, both of N.J., assignors to Estey Corporation, Red Bank, N.J.

Filed Sept. 2, 1970, Ser. No. 69,012
Int. Cl.[2] A47B *53/00*
U.S. Cl. 312—198 **10 Claims**



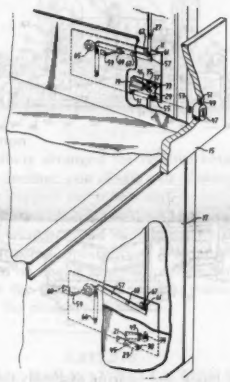
1. A storage means with shiftable units for personnel access thereto comprising; a plurality of movable storage stacks for storage of material mounted in parallel relationship to each other; movable supporting means for each of said stacks to be moved for providing access space between any two of the stacks, each supporting means including a rotatable shaft, wheels on the shaft, and a reversible electric motor coupled to the shaft; relay means for controlling the direction of rotation of the motors; a plurality of manually operable switches for selecting the access aisle to be used; a first relay control circuit actuated by one of said switches for first energizing the motor of the stack adjacent an initially open aisle and sequentially operating the motors of the other stacks for sequentially moving the stacks between the initially open aisle and the selected aisle; a plurality of sensing switches for cutting off the current to the stack motors when the stacks move too close to each other; and a second relay control circuit connected to the manually operable switches for returning the control circuits to their original condition at the end of a motor and access operation.

3,957,324

DRAWER CABINET ANTI-TIP DEVICE

Ralph L. Klenik, Jr., and Ralph E. Dyar, both of Marietta, Ohio, assignors to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 26, 1974, Ser. No. 454,868
Int. Cl.[2] E05B *65/46;* **E05C** *7/06*
U.S. Cl. 312—218 **5 Claims**



1. A system for interlocking cabinet drawers so that only one of a column of drawers can be withdrawn from a cabinet at a time, said system comprising:

a cabinet defining drawer cavities therein for receiving drawers;

a plurality of drawers, said drawers being slideably mounted in said drawer cavities for sliding along paths between closed positions in which they are substantially fully within said drawer cavities and withdrawn positions in which they are withdrawn from said drawer cavities;

a plurality of catches formed on said drawers for moving along paths with said drawers, there being a catch on each of said drawers;

a plurality of drawer latch means pivotally mounted on said cabinet, there being a drawer latch means mounted in each of said drawer cavities adjacent to the path of the respective catch on the drawer in said cavity, said drawer latch means pivot-ting between catch-engaging and catch-disengaging positions in which they respectively move into and out of the paths of their respective catches for engaging and disengaging their respective catches, said drawer latch means respectively individually biased toward catch-engaging positions but yet each latch means being free to pivot independently of the other latch means to said catch disengaging position to allow its respective drawer to be moved from a withdrawn position to a closed position independently of movement of the other latch means;

an actuating lock rod means slideably mounted on said cabinet close to said drawer latch means, but being separate from said drawer latch means, said lock rod means

including a plurality of impinging means there being an impinging means located adjacent to each of said latch means for impinging on its respective latch means said lock rod means being longitudinally slideable between a drawer unlocking position in which its impinging means impinge on said drawer latch means to positively cause said drawer latch means to be in catch-disengaging positions and a drawer locking position in which its impinging means release said latch means to allow said latch means to rotate to catch-engaging positions and also allow said latch means freedom to pivot back to said catch-disengaging positions independently of the other latch means; and

a rod moving means comprising a plurality of cams, and cam followers, there being a cam mounted on each of said drawers for moving along a path with its drawer and there being a cam follower mounted in each of said drawer cavities adjacent to the path of its respective cam, each of said cam followers being linked to said actuating lock rod means, said cams and cam followers impinging on one another to normally hold said lock rod in said drawer-unlocking position when all of said drawers are in closed positions but for moving said lock rod to said drawer-locking position in response to any one of said drawers being withdrawn from the cabinet to prevent additional drawers from being drawn from the cabinet.

3,957,325

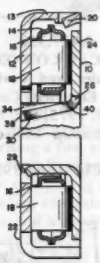
THRUST BEARING RACE

James Alex Babb, Enoree, S.C., assignor to The Torrington Company, Torrington, Conn.

Filed Aug. 6, 1975, Ser. No. 602,243

Int. Cl.² F16C *33/58*

U.S. Cl. 308—235 **4 Claims**



1. In combination with a thrust bearing having a thrust bearing cage with rolling members contained in pockets of said cage: an annular thrust plate having a plurality of channels circumferentially spaced on the inner periphery of the annular plate; and an axially extending segmented flange for guiding the thrust bearing cage extending from the inner periphery of the annular plate, each segment having each circumferential end forming at least a part of a side of a channel, each segment also having a turned-in portion extending from each of its circumferential ends.

3,957,326

HOT FOOD COUNTER

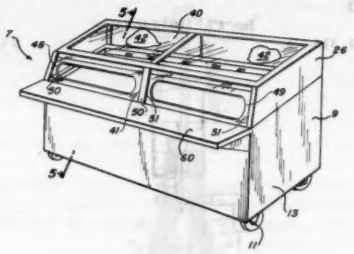
Victor D. Molitor, Denver, Colo., assignor to Saga Corporation, Menlo Park, Calif.

Filed Jan. 3, 1975, Ser. No. 538,284

Int. Cl.² A47F *03/04*

U.S. Cl. 312—236 **11 Claims**

1. A hot food counter, comprising: a tray for holding hot food for display; wall means for forming an enclosure with said tray so that displayed hot food on said tray is within said enclosure, said wall means including a front wall having exterior edges and interior edges defining at least one opening in said wall through which displayed food may be withdrawn from said enclosure without moving said front wall; and air heating and circulating means for heating air and circulating said heated air through said enclosure to elevate and maintain the temperature within said enclosure at at least a predetermined minimum elevated value sufficient to maintain displayed food within said enclosure in a hot and appetizing condition over an extended period of time with withdrawal of said displayed food from said enclosure through said opening in said front wall not significantly adversely affecting the elevated temperature within said enclosure.



3,957,327

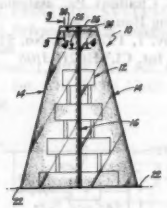
PROTECTIVE COVER FOR WEDDING CAKES, OR OTHER DISPLAY ITEMS

Richard A. Parrish, Costa Mesa, Calif., assignor to Parrish's Cake Decorating Supplies, Inc., Los Angeles, Calif.

Filed Nov. 4, 1974, Ser. No. 520,267

Int. Cl.² A47B *47/00*

U.S. Cl. 312—284 **6 Claims**



1. A protective cover for decorative cakes and the like which rest on an underlying support surface, comprising a body portion formed of flexible transparent material with upstanding upwardly convergent walls and including overlapping edges removably connected together by seam means for enclosing the cake in a conical chamber formed between said body portion and the support surface, said body portion further including bottom edge means engaging the support surface at a location displaced from the outer edge of the cake for supporting said body portion over the cake without contacting the cake.

3,957,328

METHOD OF MANUFACTURING A MERCURY VAPOUR DISCHARGE LAMP

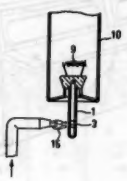
Rein Willense van der Wolf; Johannes Antonius Maria Ridders, and Cornelis Wilhelmus Adrianus Blommerde, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 14, 1974, Ser. No. 442,571

Claims priority, application Netherlands, Mar. 16, 1973, 733673

Int. Cl.² H01J *9/385*

U.S. Cl. 316—3 **8 Claims**



1. A method of manufacturing a mercury vapour discharge lamp from an envelope provided with an exhaust tube which comprises depositing a quantity of amalgam paste, which releases mercury when heated, at one axial portion of said exhaust tube, said depositing being accomplished with a second tube having an external diameter smaller than the internal diameter of the exhaust tube and a plunger disposed in said second tube, said second tube carrying a quantity of amalgam paste within the interior thereof at one end, said second tube being positioned in the exhaust tube and said plunger being axially positioned to displace a quantity of amalgam paste, spreading said paste about the interior surface of said tube mechanically to form a thin coating of amalgam on an axial portion of the inner wall of the exhaust tube; exhausting of the lamp, releasing mercury by heating the amalgam and sealing the exhaust tube between the envelope and the area where the amalgam was present.

3,957,329

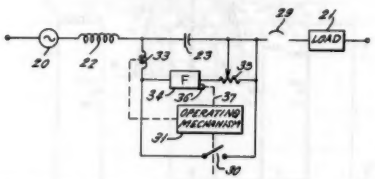
FAULT-CURRENT LIMITER FOR HIGH POWER ELECTRICAL TRANSMISSION SYSTEMS

Lorne D. McConnell, Chalfont, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Nov. 1, 1974, Ser. No. 519,993

Int. Cl.² H02H *3/08*

U.S. Cl. 316—16 **13 Claims**



1. A fault-current limiting device for a high power electrical transmission line, comprising in combination:

a dead tank housing for said fault-current limiting device; said housing having bushing terminal means containing spaced and insulated first and second terminals adapted for series connection in a power transmission line;

a series-connected inductor and capacitor mounted within said housing and connected in series with said first and second terminals; said inductor and said capacitor being tuned to one another for series resonance at the frequency of said power transmission line;

a high-speed contact switching device and an operating mechanism therefor for opening and closing said high speed contact switching device; said high-speed contact switching device being mounted within said housing and being connected in parallel with said capacitor; said switching device being normally open;

pick-up means connected in series with said switching device for monitoring the current flowing therethrough;

a high-speed current-responsive device mounted within said housing and connected in parallel with said capacitor and in series with a calibrating resistor, whereby, when the current through said fault-current device exceeds a definite and predictable value of current and time or current-squared and time, said current-responsive device is operated to limit current flow therethrough; said current-responsive device having a mechanical output member connected thereto and actuated in response to the operation of said current-responsive device;

said mechanical output member and said pick-up means being connected to said operating mechanism of said high-speed contact switching device, whereby, when the current in said transmission line exceeds said given value, said current-responsive device is operated to cause said normally open high-speed contact switching device to close, thereby to short-circuit said capacitor and to allow said inductor to exert a current-limiting action on the continued rise of current said transmission line; said pick-up means actuating said operating mechanism to permit said high-speed contact switching device to open only when the current flowing through said switching device falls below another predetermined value, thereby removing the short-circuit from said capacitor after the fault-current is limited to a value less than said another predetermined value.

3,957,330

ELECTRICAL CONNECTIONS

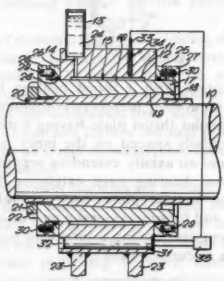
Colin Roscoe, Mold, Wales, and Kevin Lucas, Widnes, England, assignors to The Electricity Council, London, England

Filed Mar. 27, 1975, Ser. No. 562,727

Claims priority, application United Kingdom, Mar. 27, 1974, 13598/74

Int. Cl.² H01R *39/00*

U.S. Cl. 339—5 L **14 Claims**



1. An electrical connection between a rotatable member having at least a portion thereof formed with a cylindrical surface, and a conductive stationary member having a surface complementary to at least a portion of said cylindrical surface and being arranged adjacent thereto, the rotatable member being in the form of a composite structure comprising an inner portion, an annular outer portion spaced from the inner portion, having a taper internal surface and being locked to the inner portion by means of an arrangement including a split taper sleeve disposed between the inner and outer portions, at

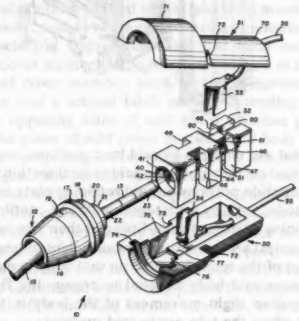
least one of said complementary surface and said cylindrical surface having a recess therein such as to form a space between the stationary and rotatable members, the connection including a conductive liquid contained in the space, and sealing means arranged to prevent leakage of conductive liquid from the space, and wherein the stationary member has connector means for enabling an electrical connection to be made thereto.

3,957,331

SWIVEL CONNECTOR FOR ELECTRICAL APPLIANCES

James M. Tantillo, Brockton, and Donald C. Ramsay, Braintree, both of Mass., assignors to Component Manufacturing Service, Inc., West Bridgewater, Mass.

Continuation of Ser. No. 475,416, June 3, 1974, abandoned. This application Mar. 10, 1975, Ser. No. 557,052
Int. Cl.[2] H01R *39/00*
U.S. Cl. 339—6 R **2 Claims**



1. A swivel connector for mechanically and electrically joining an electric cord to an electric appliance,

said connector comprising a first axially aligned major body section and a second axially aligned major body section,

said first body section comprising a first plastic casing with an outwardly extending elongated prong,

said prong having a central axis with axially spaced first and second contacts thereon,

said first casing defining a swivel bearing boss surrounding a portion of said prong,

first means mounted on said first casing for coacting with second means on said second body section for together stopping axial movement of said prong while permitting swivel movement thereof about said central axis,

said first and second means for stopping axial movement of said prong while permitting swivel movement thereof comprising respectively a circular boss and means defining a mating circular recess,

said second body section comprising,

a contact mounting block and a second plastic casing constructed and arranged to interlock with said first casing,

said mounting block being formed of a plastic material and defining a swivel bearing recess mating with said swivel bearing boss and an elongated prong receiving recess axially aligned with said swivel bearing recess and boss,

a pair of contacts axially spaced along said prong receiving recess and resiliently engaging corresponding prong contacts, said pair of contacts each being resilient spring double wiping contacts extending into said prong receiving recess and each comprising a generally U shape having resilient flat leaves for the arms of the U,

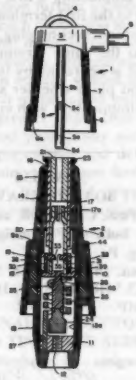
said second body section plastic casing carrying means for positively positioning said pair of contacts.

3,957,332

ELECTRIC CONNECTOR APPARATUS AND METHOD

George L. Lambert, III, Lilburn, Ga., assignor to Kearney-National, Inc., Atlanta, Ga.

Filed May 2, 1975, Ser. No. 574,018
Int. Cl.[2] H01R *11/30*
U.S. Cl. 339—12 R **19 Claims**



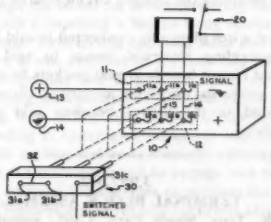
1. Electric connector apparatus comprising hollow elongated support structure, a tubular electric contact mounted within said support structure and movable longitudinally relative thereto between a normal closed circuit position and an interim position, said interim position being spaced longitudinally from said normal position, a contact pin movable independently of said support structure for engaging and disengaging said tubular contact, and latch means movable with said contact and engageable with a part of said support structure for preventing substantial movement of said contact from its normal position toward its interim position, said latch means being activated by movement of said contact pin relative to said tubular contact.

3,957,333

UNIVERSAL CONTROL SYSTEM INTERFACE

David C. Kaminski, Sylvania, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Nov. 1, 1974, Ser. No. 520,083
Int. Cl.[2] H01R *27/00*
U.S. Cl. 339—32 R **4 Claims**



1. In a control system having an element thereof adapted for energization by an external signal providing selective communication with a hot source or a ground source, an interface means comprising a first and second plugs said first plug including two sets of corresponding terminals with three termi-

nals per set a first terminal of said first set connected to a hot source and the corresponding terminal of said second set connected to a ground source, a second terminal on said first set connected to said element and to a second terminal of said second set, the third terminal of said first set connected to said element and to a third terminal of said second set, said second plug including three terminals adapted for selective connection to either said first or said second set of terminals on said first plug a jumper connecting a first terminal of said second plug corresponding to the first terminals on said first plug with a second terminal on said second plug, and said external signal being connected to the third terminal of said second plug whereby said circuit is operable, by the proper connection of said first and second plugs whether said external signal provides selective communication with either a ground source or a hot source.

3,957,334

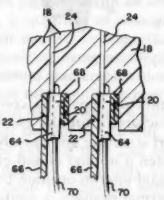
PRINTED CIRCUIT BOARD ARRAY FOR CARD-READER

Raymond Vincent Pass, Camp Hill, and Daniel Joseph Crowley, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 14, 1975, Ser. No. 541,026

Int. Cl.² H01H *43/08*; H05K *1/07*

U.S. Cl. 339—75 MP **1 Claim**



1. In a card reader having a fixed circuit board and a movable read head carrying electrical contacts for engagement on said circuit board and wherein an apertured card is interposed between the contacts and the circuit board such that the card apertures permit communication of selected contacts with the circuit board, the improvement comprising:

a plurality of dielectric strips on the read head laminated together and sandwiching therebetween the electrical contacts for engagement against said circuit board,

recessed portions of said dielectric strips defining pockets into which barrel potions of the electrical contacts project,

printed circuit boards pluggably received in said pockets together with resilient means received in said pockets for biasing the barrel portions of said contacts into electrical engagement on the printed circuit boards and for wedgingly retaining the printed circuit boards in said pockets, and

electrical wires pluggably connected in said barrel portions for providing electrical inputs to said contacts, the printed circuit boards in said pockets being spaced from each other for receiving electrical circuit components disposed in the spaces between said printed circuit boards.

3,957,335

TERMINAL BLOCK ASSEMBLY

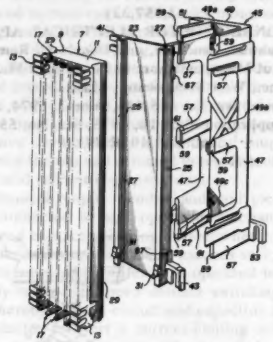
Michael K. Troy, Menlo Park, Calif., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed July 26, 1974, Ser. No. 492,057

Int. Cl.² H01R *9/02*; H02B *1/02*

U.S. Cl. 339—125 R **5 Claims**

1. A terminal block assembly comprising a dielectric body having a central section and fanning strip sections at opposed margins of the central section, said central section having plurality of side-by-side rows of holes, electrically conductive terminals loosely received in said holes and projecting therethrough, said terminals having wire receiving portions on one side of said central section and base portions on the opposite side of said central section and in engagement therewith, said wire receiving portions lying intermediate said fanning strip sections, a retaining plate on said central section and engaging said base portions such that said base portions are confined between said retaining plate and the parts of said central



section that are engaged by said base portions, and means for securing said retaining plate to said central section; said means comprising slide portions on said retaining plate engaging ribs on said body, spring tabs integral with and cantilevered from said retaining plate and snap-fitting at their tips with recesses on said central section an amount sufficient to prevent sliding movement of the retaining plate on said body in one direction, and stops on said body adapted to engage the fixed ends of said tabs upon slight movement of the body in the opposite direction when the tabs are in said recesses.

3,957,336

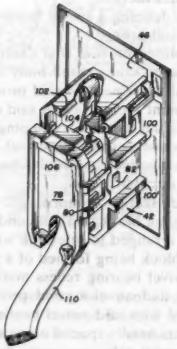
ELECTRICAL RECEPTACLE

Menashe Bromberg, West Orange, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Oct. 7, 1974, Ser. No. 512,414

Int. Cl.² H01R *21/02*

U.S. Cl. 339—156 R **2 Claims**



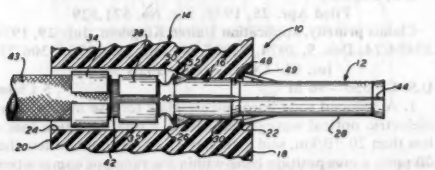
1. An electrical receptacle comprising, in combination, a body member formed from electrically insulating plastic material and including wall portions joined to one another to define a cable receiving cavity, said wall portions being seated upon a base portion molded intergrally therewith, said base portion

having a flanged portion extending outwardly beyond the external perimeter of said wall portions for mounting said body member to a supporting surface, said base portion having contact supports selectively located within said cable receiving cavity for supporting at least a pair of spaced electrical contacts therewithin, said base member being suitably apertured to provide plug receiving slots arranged to accept the contacts of an electrical plug, said base member further having at least a pair of electrical contacts disposed within said contact supports and aligned with respective ones of said base member slots to receive the contacts of an electrical plug inserted within said base member apertures; and a cover member formed from electrically insulating plastic material and arranged to selectively seat against said wall portions to provide a closure for the exposed opening of said body member cable receiving cavity, said cover member including cable support means disposed adjacent one surface thereof, said cable support means being selectively positioned on said cover member for alignment with said body member contact supports upon the selective seating of said cover member against said body member wall portions for urging the respective conductors of an electrical cable against respective ones of said electrical contacts located within said body member cable receiving cavity, said cover member further comprising latch means for selective engagement with said body member to permit said cover member to be releasably locked to said body member, said cover member latch means comprising a first latch portion and a second latch portion extending, respectively, from opposing sides of said cover member generally normal to the plane of said cover portion, said body member wall portions comprising a first sidewall and a second sidewall arranged in generally parallel spaced relationship, each of said first and said second sidewalls having guide means cooperative with a respective one of said first and said second cover member latch portions to selectively locate said cover member on said body member, said body member wall portions further comprising a first end wall and a second end wall, each of said first and said second end walls being joined to a respective end of each of said first and said second sidewalls, at least one of said first and said second end walls having a notched portion arranged to provide clearance for an electrical cable received within said cable receiving cavity, said cover member further comprising an upstanding portion located generally adjacent one end of said cover member, said upstanding portion being selectively dimensioned to mate with said body member end wall notched portion to provide a closure thereat.

3,957,337
MINIATURE ELECTRICAL CONNECTOR HAVING CONTACT CENTERING MEANS

Ralph R. Damiano, Naugatuck, Conn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Feb. 21, 1975, Ser. No. 551,704
Int. Cl.² H01R 9/08
U.S. Cl. 339—217 S **8 Claims**



1. An electrical connector having contact centering means, comprising:

an insulated housing having a front and a rear surface and a passageway between said surfaces, said passageway radially enlarged from said rear surface toward said front surface to form a contact receiving chamber which is merged with said passageway by an inwardly and forwardly tapering surface;

a sheet metal contact rolled to form a contact mating section, a housing latch section, and an open barrel crimp section mounted within said passageway;

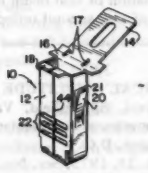
said housing latch section including leaf spring means directed toward the rear of said contact which yield as said contact passes through said passageway and snap out from said passageway as said spring means clear said front housing surface to prevent rearward movement of said contact; and

said housing latch section further including three triangular based protrusions, each protrusion having sides extending from said rolled sheet metal surface which terminate in a generally sharp outwardly and rearwardly tapering edge, and each protrusion equally spaced about the periphery of said housing latch section, said outward and rearward taper being at a greater angle than said forward and inward taper of said passageway surface wherein said sharp tapering edges engage and deform said tapering surface of said housing to prevent further forward movement of said contact, to prevent rotational movement of said contact, and to center said contact within said housing.

3,957,338
ELECTRICAL TERMINAL CONNECTOR WITH BOWED AND CURVED TINES AND SERRATIONS

Paul A. Maximoff, Schaumberg, Ill., assignor to Midway Mfg. Co., Franklin Park, Ill.

Filed June 18, 1975, Ser. No. 588,019
Int. Cl.² H01R 13/12
U.S. Cl. 339—258 R **5 Claims**



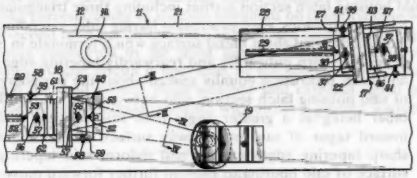
1. A terminal connector for securing electrical lead wires to a base board having opposite surfaces and having apertures extending through the board for accommodating the connector, the connector comprising a hollow body substantially in rectangular tubular form having opposing sides and ends, the body being open at one end thereof for receiving wires and a partially closed opposite end to provide a stop for wires, a plurality of gripping tines positioned substantially on the same plane extending from a first side surface of the rectangular body and extending in converging cantilever relation toward the opposite side surface and away from the opening, flanges extending from the body arranged to engage one surface of the base board adjacent the aperture to position the terminal connector, and resilient cantilever lugs for firmly abutting and engaging the opposite side of base boards of varying thicknesses, wherein the improvement comprises said tines converging toward the opposite side in a convex manner, the converging ends of the tines being positioned adjacent and touching said opposite side surface and are arcuately shaped along their cross section to firmly engage wires inserted into said body.

3,957,339

LASER BEAM SHAPING ARRANGEMENT

Simon L. Engel, Mountain View, Calif., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 12, 1974, Ser. No. 487,914
Int. Cl.[2] G02B 27/00
U.S. Cl. 350—6 10 Claims



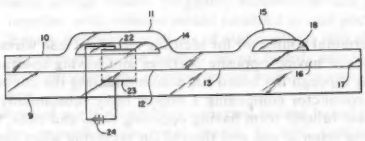
1. Apparatus for shaping an annular beam of electromagnetic energy to evenly distribute the energy thereof over a generally rectangular area of selected width and length, comprising means for providing said annular beam, a first concave cylindrical reflector means positioned to receive said beam and providing convergence of said beam in a first dimension normal to the axis of said beam, a second concave cylindrical reflector means positioned to receive said beam from said first reflector means and providing convergence of said beam in a second dimension normal to both said first mentioned dimension and the axis of said beam, a third reflector means comprising a flat reflecting mirror positioned to receive said beam from said second reflector means, a work station positioned to receive said beam after reflection from said third reflector means, said first reflector means having a longer focal length than said second reflector means and said work station being positioned substantially at the line of focus of said second reflector means, and means vibrating said third reflector means to cause oscillation of said beam in a direction normal to said line of focus of said second reflector means.

3,957,340

ELECTROOPTICAL AMPLITUDE MODULATOR

Thomas G. Giallorenzi, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 25, 1975, Ser. No. 553,053
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96 WG 3 Claims



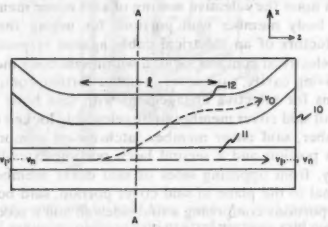
1. An electrooptical waveguide amplitude modulator, which comprises:
an optical waveguide;
said optical waveguide including an input section;
a first branching two arm section with one arm continuously joining said input section;
said first branching two arm section joined together at their output ends in a single continuous waveguide output section;
said single output waveguide section formed into a second branching two arm section;
one arm of said second branching arm section tapering into a zero thickness and the other branch continuing to a waveguide output end section joined therewith;
at least one arm of said first branching arm section having an electrooptical material region;
optically transparent electrodes on opposite sides of said electrooptical material region; and
an electrical voltage means electrically connected with said electrodes for applying a voltage across said electrooptical material region upon demand.

3,957,341

PASSIVE FREQUENCY-SELECTIVE OPTICAL COUPLER

Henry F. Taylor, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 3, 1974, Ser. No. 502,596
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96 C 9 Claims



1. A passive frequency-selective optical coupler comprising:
a first dielectric waveguide having a combination of dimensions and refractive index for producing a determinable guided mode phase propagation constant of light energy at a known frequency;
a second dielectric waveguide having a different combination of dimensions and refractive index for producing a guided mode phase propagation constant at said known frequency identical to that of said first dielectric waveguide at said known frequency and producing different phase propagation constants at all other frequencies; and
a portion of said first dielectric waveguide arranged in proximate spatial disposition relative to said second dielectric waveguide over a sufficient length for selectively coupling light energy therebetween at said known frequency only.

3,957,342

SODIUM BOROSILICATE GLASSES FOR DIELECTRIC OPTICAL WAVEGUIDES

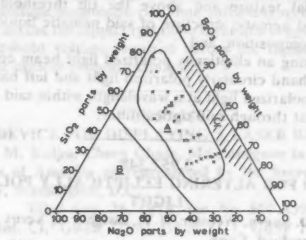
George Reginald Newns, Hintlesham, and Keith John Beales, Henley, both of England, assignors to The Post Office, London, England

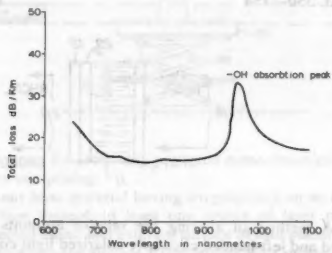
Filed Apr. 25, 1975, Ser. No. 571,529
Claims priority, application United Kingdom, July 29, 1974, 33484/74; Dec. 9, 1974, 53097/74; Jan. 24, 1975, 3306/75
Int. Cl.[2] C03C 13/00; G02B 5/14
U.S. Cl. 350—96 M 5 Claims

1. A reduced soda-boro-silicate glass for use in fabricating dielectric optical waveguides having a total insertion loss of less than 20 dB/km, said glass having an OH content less than 20 ppm, a composition lying within the range of compositions defined by Region A of FIG. 1, and lying outside the region of phase separation of soda-boro-silicate glasses, said glass containing between 0.1% and 5% by weight of a redox buffering oxide to minimize absorption due to presence of transition metal ion impurities, said oxide being selected from the group consisting of arsenic trioxide, antimony trioxide and cerium oxide.

4. A dielectric optical waveguide having a core and cladding both consisting of soda-boro-sillicate glass compositions in

accordance with claim 1, in which the refractive index of the glasses differs by at least 1%, the cladding glass refractive





index being lower than that of the core glass, and the total insertion loss being lower than 20 dB/km at a wavelength of between 750 mm – 850 mm.

3,957,343

OPTICAL COMMUNICATIONS SYSTEMS

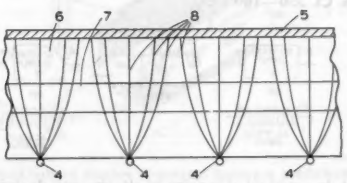
Richard Burnaby Dyott, and John Leslie Stevenson, both of London, England, assignors to The Post Office, London, England

Continuation of Ser. No. 417,052, Nov. 19, 1973, abandoned. This application Apr. 11, 1975, Ser. No. 567,429

Claims priority, application United Kingdom, Nov. 24, 1972, 54412/72

Int. Cl.² G02B 5/14

U.S. Cl. 350—96 WG **28 Claims**



1. A mode coupler for transferring energy between different modes of propagation in a dielectric optical waveguide having a core of homogeneous phase and a cladding comprising:

a section of dielectric optical waveguide of substantially circular cross-section having a core, said core being of a type whose refractive index varies in response to the presence of an electric field; and

electrodes disposed on an external surface of the said cladding for applying an electric field to said core, said field being characterized by undulatory variations spaced along a direction of propagation in said wave guide to produce undulatory variations in the refractive index of said core correspondingly spaced along said core in said direction.

3,957,344

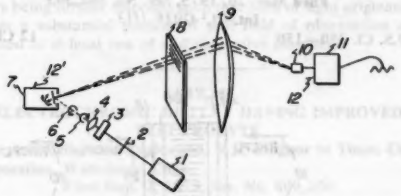
INFORMATION TRANSFER SYSTEM

Franklin D. Saeva, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 26, 1975, Ser. No. 562,066

Int. Cl.² G02F 1/13

U.S. Cl. 350—150 **20 Claims**



1. A method for transferring information, comprising:

a. providing in the twisted nematic structure a nematic liquid crystalline material in contact with an extrinsically optically active material having an absorption band within which circular dichroism is induced by said contact with the twisted nematic structure of said nematic liquid crystalline material;

b. directing at least one right-handed circularly polarized light pulse and at least one left-handed circularly polarized light pulse upon the same point of interest of said material, said light pulses being of equal intensity and within the absorption band of said extrinsically optically active material; and

c. subsequently converting the relative magnitude of said at least one right and left-handed circularly polarized light pulses into a signal.

3,957,345

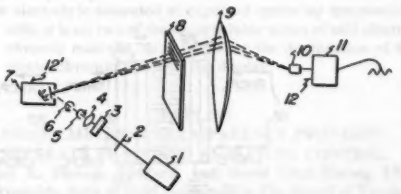
INFORMATION TRANSFER SYSTEM

Franklin D. Saeva, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 26, 1975, Ser. No. 562,067

Int. Cl.² G02F 1/13

U.S. Cl. 350—150 **10 Claims**



1. A method for transferring information, comprising:

a. providing in the twisted nematic structure a nematic liquid crystalline composition having positive dielectric anisotropy and an absorption band which exhibits circular dichroism when said nematic composition is in the twisted nematic structure;

b. directing at least one right-handed circularly polarized light pulse and at least one left-handed circularly polarized light pulse through a point in said twisted nematic liquid crystalline composition, said light pulses prior to impingement being of equal intensity and within the

absorption band of said twisted nematic liquid crystalline composition; and

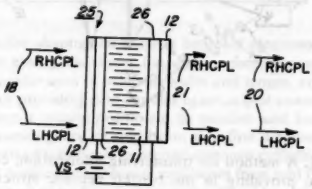
c. subsequently converting emerging relative intensities of said at least one right and left handed circularly polarized light pulses into a signal.

3,957,346

METHOD FOR ALTERING ELLIPTICALLY POLARIZED LIGHT

Franklin D. Saeva, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 26, 1975, Ser. No. 562,303
Int. Cl.² G02F 1/13
U.S. Cl. 350—150 **12 Claims**



1. A method of altering the relative amounts of right-handed and left-handed circularly polarized light components in elliptically polarized light having a wavelength within a region of interest, comprising:

a. providing an optical filter comprising a nematic liquid crystalline composition in the twisted nematic structure, said twisted nematic composition having an absorption band defining said region of interest; and

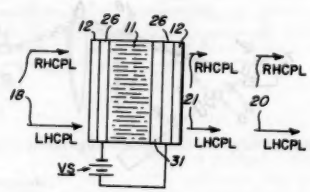
b. directing a beam of elliptically polarized light comprising right-handed and left-handed circularly polarized light at a wavelength within said region of interest through said optical filter.

3,957,347

SELECTIVELY VARIABLE CIRCULARLY DICHROIC FILTERING METHOD

Franklin D. Saeva, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 26, 1975, Ser. No. 562,304
Int. Cl.² G02F 1/13
U.S. Cl. 350—150 **18 Claims**



1. A method of selectively varying the relative amounts of right-handed and left-handed circularly polarized light components in elliptically polarized light having a wavelength within a region of interest, comprising:

a. providing, between two electrodes, an optical filter comprising a positive dielectrically anisotropic nematic liquid crystalline composition in the twisted nematic structure and in contact with an extrinsically optically active material having an absorption band defining said region of interest.

b. applying, between said two electrodes, a voltage level below the threshold value for transition of said nematic from the twisted nematic structure to the homeotropic uniaxial texture and above the tilt threshold for the twisted nematic structure of said nematic liquid crystalline composition; and

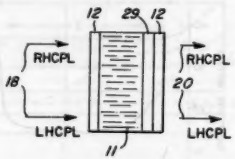
c. directing an elliptically polarized light beam comprising right hand circularly polarized light and left hand circularly polarized light at a wavelength within said region of interest through said optical filter.

3,957,348

METHOD FOR ALTERING ELLIPTICALLY POLARIZED LIGHT

Franklin D. Saeva, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 26, 1975, Ser. No. 562,305
Int. Cl.² G02F 1/13
U.S. Cl. 350—154 **11 Claims**



1. A method of altering the relative amounts of right-handed and left-handed circularly polarized light components in elliptically polarized light having a wavelength within a region of interest, comprising:

a. providing an optical filter comprising a nematic liquid crystalline composition in the twisted nematic structure in contact with an extrinsically optically active material, said extrinsically optically active material having an absorption band defining said region of interest; and

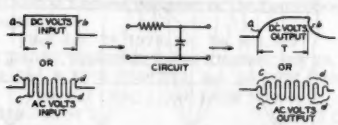
b. directing a beam of elliptically polarized light comprising right-hand and left-hand circularly polarized light at a wavelength within said region of interest through said optical filter.

3,957,349

IMAGING METHOD

Kyler F. Nelson, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 29, 1974, Ser. No. 492,580
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC **15 Claims**



1. In a method of imaging an electro-optic device of the type having two electrodes sandwiching a photoconductive layer in contact with a liquid crystalline layer wherein the liquid crystalline layer is capable of undergoing an optical property change in response to a threshold voltage across the liquid crystal layer upon exposure of the photoconductor to active radiation and wherein upon substantially instantaneous application or removal of a desired voltage magnitude between the two electrodes the voltage division between the photoconductive layer and the liquid crystalline layer is such that the voltage magnitude across the liquid crystalline layer transitorily exceeds the threshold voltage magnitude required across the liquid crystalline layer for optical property change in the

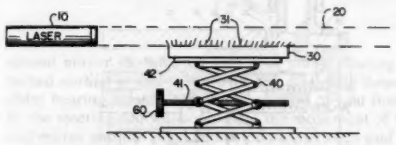
liquid crystalline layer, the improvement for reducing change of optical property in the liquid crystalline layer prior to exposure of the photoconductive layer comprising the step of applying the voltage magnitude between the two electrodes over a voltage magnitude rise time sufficient to maintain the voltage across the liquid crystalline layer at a magnitude below the threshold voltage required across the liquid crystalline layer for optical property change.

3,957,350

DEVICE FOR DISPLAYING A LASER BEAM

Stanley M. Kulpa, Chevy Chase, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 26, 1974, Ser. No. 500,839
Int. Cl.² G02B 27/00; G02F 1/11; G09F 13/16
U.S. Cl. 350—160 R **8 Claims**



1. A system for producing scattered monochromatic visible radiation comprising:

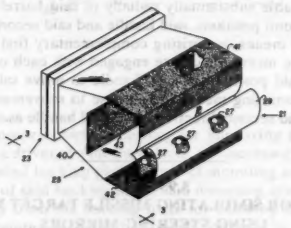
a. planar base material having irregularities on an external surface thereof; at least one source of laser radiation directed along said external surface of said planar base so as to graze the surface irregularities with incident radiation; the size of said surface irregularities being sufficient to partially scatter the incident radiation, whereby scattered monochromatic visible radiation is produced.

3,957,351

BACKLIGHTED DISPLAY APPARATUS

Glade M. Stockwell, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 16, 1974, Ser. No. 506,378
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC **5 Claims**



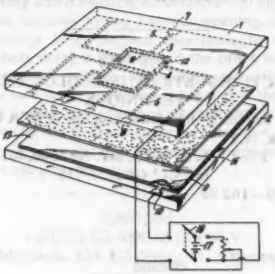
1. A backlighted display apparatus having a predetermined field of observation from which indicia are viewable, said apparatus comprising: light source means; display means having at least one segment capable of light diffusion and transparent areas; and means between said light source means and said display means for controlling the angle of incidence of rays impinging on said display surface and for causing said transparent areas to appear in contrast to the light diffusing segments, said light-controlling, contrast-providing means comprising: a prism-like, light refracting device having at least first, second, and third nonparallel surfaces, and a pair of light absorptive members cooperating with said prism-like device and disposed to produce a light passageway in the prism-like device, said first surface disposed near said light source means and at least partially geometrically configured as a converging lens for producing a concentrated beam of light directed toward said third surface through said passageway formed by said pair of light absorptive members, said third surface configured and disposed to reflect said light beam on toward said second surface, said second surface being optically bonded to said display means, said display means being disposed such that substantially all light arriving thereat from said third surface arrives at an angle greater than the critical angle of incidence, at least one of said absorptive members being disposed to intercept rays propagating from said source directly toward said display means, and said absorptive members being further disposed such that lines of sight originating from a substantial portion of said field of observation are routed to at least one of said absorptive members.

3,957,352

ELECTROCHROMIC DISPLAY HAVING IMPROVED ELECTROLYTE

Marshall Leibowitz, Englewood, N.J., assignor to Timex Corporation, Waterbury, Conn.

Filed Sept. 2, 1975, Ser. No. 609,256
Int. Cl.² G02B 5/23
U.S. Cl. 350—160 R **9 Claims**



1. In an electrochromic display of the type having first and second parallel spaced substrates with selectively actuable spaced electrodes thereon, at least some of said electrodes having electrochromic layers thereon which may exist in different oxidation states, said states having different optical, electrical, and solubility properties, and porous separator means between the first and second substrates, the improvement comprising:

an electrolyte saturated at expected operating temperature with at least two of the more soluble states of said electrochromic material, so as to reduce the degradation of the electrochromic layers of the display.

3,957,353

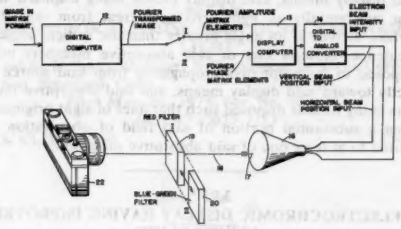
MULTIEMULSION TRANSPARENCY PROVIDING SEPARATE PHASE AND AMPLITUDE CONTROL

James R. Fienup, Stanford, and David Chau-Kwong Chu, Woodside, both of Calif., assignors to The Board of Trustees of the Leland Stanford University, Stanford, Calif.

Filed Mar. 8, 1974, Ser. No. 449,448
Int. Cl.² G02B 5/20, 27/00
U.S. Cl. 350—162 SF **27 Claims**

1. A method of synthesizing a multiemulsion transparency for producing an image of an object with a constructing beam of light, comprising the steps of: determining in matrix format the image of the object; Fourier transforming the image matrix into two transmittance matrices, one matrix having amplitude transmittance elements and the other matrix having phase transmittance elements; exposing a color reversal, multiemulsion photographic film to a representation of the amplitude

elements with a first light having a spectrum to which only a first emulsion of the film is photosensitive; exposing the film



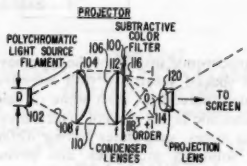
to a representation of the phase elements with a second light having a spectrum to which only a second emulsion of the film is photosensitive; and processing the film into a transparency.

3,957,354

DIFFRACTIVE SUBTRACTIVE COLOR FILTERING TECHNIQUE

Karl Knop, Zurich, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,401
Int. Cl.² G02B 27/38
U.S. Cl. 350—162 SF **61 Claims**



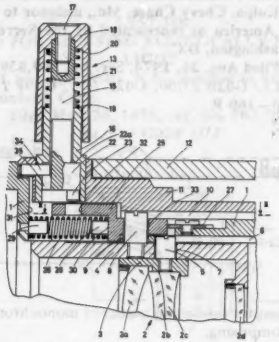
1. A subtractive color filter for use in filtering polychromatic light having a given wavelength spectrum illuminating said color filter, said color filter comprising a diffracting phase-medium including a pattern of spatially distributed diffraction elements, each diffraction element having its own predetermined waveform profile and having its own given optical peak amplitude, whereby the fraction of input light of any spectral wavelength component within said given wavelength spectrum illuminating any diffraction element of said color filter which is transferred into the zero diffraction order of output light from said color filter varies as a function of spectral wavelength in accordance with the predetermined waveform profile and given optical peak amplitude of that diffraction element, said predetermined waveform profile and given optical peak amplitude of each diffraction element of said pattern being preselected in accordance with said given wavelength spectrum of said polychromatic illuminating light to provide said subtractive color filter with a certain color-filter zero-order output light transfer function.

3,957,355

OBJECTIVE SYSTEM WITH ZOOM LENS FOR MOTION PICTURE CAMERAS

Herbert Reinsch, Kongen; Peter Korner, Reichenbach, and Horst Obermann, Stuttgart, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Nov. 18, 1974, Ser. No. 524,930
Claims priority, application Germany, Nov. 23, 1973, 2358345
Int. Cl.² G02B 15/18, 7/10
U.S. Cl. 350—187 **16 Claims**



1. In an objective system for photographic apparatus, a combination comprising a tubular barrel; a variable-focus picture taking lens having a variator system including a plurality of optical elements disposed in said barrel one behind the other and being movable axially of said barrel to thereby change the focal length of said lens and to focus the image of a subject; and means for moving said optical elements, including a handle extending outwardly from said barrel and being movable in a first direction substantially circumferentially of said barrel and in a different second direction, first motion transmitting means for moving said optical elements in response to movement of said handle in said first direction to thereby change the focal length of said lens, and second motion transmitting means for moving said optical elements in response to movement of said handle in said second direction to thereby focus the image of a subject, said handle being further movable substantially radially of said barrel between first and second positions, said handle and said second motion transmitting means comprising complementary first and second coupling means which are engaged with each other only in one of said positions of said handle to move said second motion transmitting means in response to movement of said handle in said second direction while said handle assumes said one position.

3,957,356

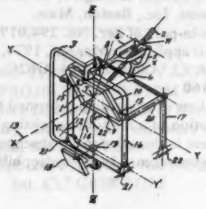
SYSTEM FOR SIMULATING MISSILE TARGET MOTION USING STEERING MIRRORS

Richard Payne Pledger, Fort Worth, Tex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 28, 1975, Ser. No. 563,252
Int. Cl.² G02B 5/08, 27/17
U.S. Cl. 350—301 **3 Claims**

1. A system for simulating missile target motion using steering mirrors comprising: a gimbal; a first mirror pivotally mounted within the gimbal; a base; a frame pivotally mounted on said base and adapted to support said gimbal; a first pair of parallel links pivotally mounted on the base; a second pair of parallel links connecting said first pair of parallel links to said frame; means connecting one pair of first and second parallel links to another pair of first and second parallel links and

maintaining the one pair in a spaced relationship to the other pair; a first bifurcated link at one end connected to sad means; a second bifurcated link at one end connected to said first bifurcated link; a slider bearing means connecting the first and second bifurcated links; an arm, pivotally mounted to the frame, connected to one end of said second bifurcated link; a



second mirror mounted on said arm; and a steering rod attached normal to said first mirror and extending through said slider bearing means, whereby movement of said first mirror by the steering rod will coordinate the movement of the second mirror and the angular relationship between said mirrors will remain constant.

3,957,357

COMBINED REAR VIEW MIRROR AND SUNVISOR

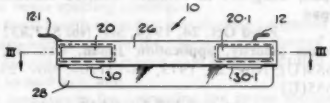
Adolf Kulikowski, Neser House No. F 14, Windhoek, South Africa

Filed Oct. 1, 1974, Ser. No. 510,961

Claims priority, application South Africa, Oct. 3, 1973, 73/7757

Int. Cl.[2] G02B *5/08*

U.S. Cl. 350—304 **1 Claim**



1. A motor vehicle accessory for improving the rearward vision of a driver of a motor vehicle, said accessory comprising an elongated backing plate, a pair of mounting arms adjacent the ends of said backing plate, said mounting arms projecting outwardly from the backing plate for enabling the accessory to be mounted on mounting means directly in front of the driver inside the vehicle, a flexible mirror support plate of longer length than the backing plate, said mirror support plate extending forwardly of the backing plate and having its ends attached to the backing plate, a pair of mirrors having their backs attached to the mirror support plate and their faces inclined away from each other, each mirror having adjustment means associated therewith for varying the angle of the mirror relative to the backing plate, a transparent strip of plastics material extending over the front of both mirrors, a layer of soft protective material extending over the front of and at least partly behind the accessory, said soft protective material containing apertures at positions in front of the mirrors, and a sun visor panel hingedly mounted to the accessory adjacent the lower edge of the elongated backing plate.

3,957,358

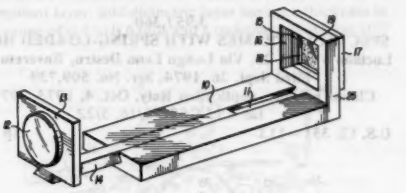
VIEWER FOR MICROREPRODUCTION ON A TRANSPARENT FILM

Robert G. Holliday, Ann Arbor, Mich., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 8, 1974, Ser. No. 522,122

Int. Cl.[2] G02B *27/02*

U.S. Cl. 350—239 **12 Claims**



1. A device for viewing microreproductions on transparent film which comprises a magnifying lens, means for supporting the lens and a means for supporting a microreproduction in association with the lens for magnification thereof, said means for supporting the microreproduction comprising a first frame member having a first opening secured thereto and a separate second frame member having a second opening, said first and second openings being aligned therethrough, one of said frame members being a magnet and the other being attractable by a magnet, whereby a microreproduction disposed between the said frame members is supported thereby across the said first and second openings when the attractable frame member is attracted to the magnet, at least one of said supporting means being slidably movable towards and from the other for focusing purposes.

3,957,359

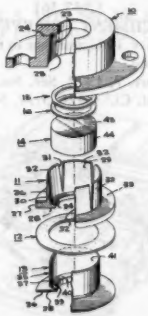
SIGHT GLASS ASSEMBLY

Charles E. Meginnis, 529 1/2 Nancy St., Charleston, W. Va. 25302

Filed Jan. 23, 1975, Ser. No. 544,199

Int. Cl.[2] G02B *27/02, 7/00*

U.S. Cl. 350—319 **22 Claims**



1. A sight glass assembly adapted to be mounted across an opening in a vessel containing a fluid, comprising a housing having an opening registerable with said vessel opening, means for mounting said housing on said vessel when said housing opening is registered with said vessel opening, said housing opening having a frusto-conically shaped wall section, an annular lens holder mounted on said housing, and a lens having a peripheral side wall mounted in said lens holder across the opening in said holder, said holder having a collet portion including a plurality of circumferentially spaced fin-

gers having interior surfaces engagable with the peripheral side wall of said lens and exterior surfaces engagable with said frusto-conically shaped wall section of said housing opening, said collet fingers being urged into camming relation with said frusto-conically shaped wall section of said housing opening whereby said collet fingers are cammed laterally inwardly toward said lens, placing the periphery of said lens in radial compression.

3,957,360

SPECTACLE FRAMES WITH SPRING-LOADED HINGES

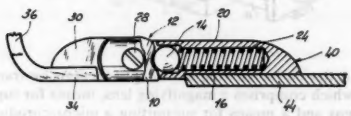
Luciano Villani, 23, Via Lungo Leno Destro, Rovereto, Italy

Filed Sept. 26, 1974, Ser. No. 509,739

Claims priority, application Italy, Oct. 4, 1973, 29762/73

Int. Cl.² G02C *5/16, 5/22*

U.S. Cl. 351—113 **16 Claims**



1. A spectacle frame conprising a front piece having respectively spaced side end portions; a cam element rigidly connected to each one of said side end portions of said front piece and with said cam element having a cam surface; a connecting element for each side end portion having a substantially flat end portion; means for mounting said connecting elements on said side end portions for movement between a closed and an open position; cam follower means accommodated in each of said connecting elements and including at least one cam follower member and means for urging said cam follower member into contact, with said cam surface; and side pieces, each side piece having a substantially flat end portion rigidly connecting one side piece to and overlying a respective one of said connecting elements at only one side thereof which faces away from said front piece when the respective connecting element is in said closed position thereof, whereby said end portion of each of said side pieces at least partly conceals said respective connecting element from view in a direction normal to and facing said one side of said connecting element.

3,957,361

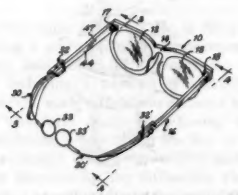
SPRING ATTACHMENT FOR EYEGLASS FRAMES

Dario Buccicone, Gary, Ind., assignor to Bucciconi Engineering Co., Inc., Gary, Ind.

Filed Nov. 7, 1974, Ser. No. 521,574

Int. Cl.² G02C *5/14, 5/20*

U.S. Cl. 351—123 **9 Claims**



1. A spring attachment for eyeglass frames which have a lens holding portion with pivotally mounted temple arms at each side thereof, said attachment comprising an elongate, resilient wire member having a portion at one end for removably attaching to a temple arm and a pad formation at the other end, said temple attaching portion being formed so that it may be secured on the temple arm for adjustment lengthwise of said temple arm with said other end extended and curved inwardly and upwardly so as to bring the pad formation into resilient engagement with an upper portion of the back of the wearer's head when the glasses are worn in normal position.

3,957,362

HYDROGELS AND ARTICLES MADE THEREFROM

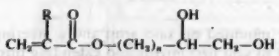
William L. Mancini, Framingham; Donald R. Korb, Boston, and Miguel F. Refojo, Lexington, all of Mass., assignors to Corneal Sciences, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 294,019, Oct. 2, 1972, abandoned. This application Mar. 18, 1974, Ser. No. 451,906

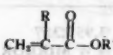
Int. Cl.² C08F *220/14;* **G02C** *7/04*

U.S. Cl. 351—160 **32 Claims**

1. A contact lens of a copolymer formed by the free radical bulk polymerization of a mixture consisting essentially of two acrylic monomers in the substantial absence of water or other diluent, said first monomer being hydrophilic and conforming to the formula:



where R is hydrogen or methyl and *n* is a whole integer having a value of from 0 to 4, and said second monomer being substantially water insoluble and conforming to the formula:



where R is as above described and R′ is alkyl having from 1 to 6 carbon atoms, the mole ratio of said first acrylate to said second acrylate varying between 1:1 and 10:1, said copolymer being insoluble in a solvent system comprising 60% by volume acetone and 40% by volume dioxane.

3,957,363

MOTION PICTURE CAMERA WITH SYNCHRONOUS RECORDING SYSTEM

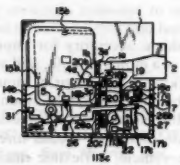
Yoshihisa Hayashi, Tondabayalshi, and Yukio Miki, Saki, Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Oct. 24, 1974, Ser. No. 517,832

Claims priority, application Japan, Oct. 24, 1973, 48-122655[U]; Nov. 24, 1973, 48-131204; Nov. 24, 1973, 48-134655[U]

Int. Cl.² 352 *29;* **G03B** *23/02*

U.S. Cl. 352—72 **7 Claims**



1. A motion picture camera capable of selectively utilizing both sound film cassettes and silent film cassettes, each being of a different size than the other, and provided with a synchronous recording system, comprising:

a cassette chamber adapted to receive a selected cassette;

means for detecting the type of a cassette selected by sensing the size of a film cassette loaded within said cassette chamber;

a drive means for driving a film in such film cassette loaded within said cassette chamber for a photographing operation;

film feed speed setting means coupled to said drive means for setting one of at least two different film feed speeds for a film to be driven by said drive means; and,

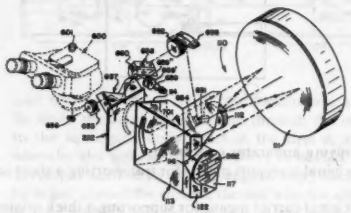
control means for setting said camera to one of the film feed speeds which may be selectively set by said film feed speed setting means when said sensing means detects a sound film cassette loaded within said camera, such film speed being suited for permitting normal photographing of a sound film in conjunction with synchronous sound recording.

3,957,364

COARSE VIEWING SYSTEM FOR AN ANNULAR FIELD PROJECTION SYSTEM

David A. Markle; Jere D. Buckley, both of Norwalk, and Raul E. Casas, Danbury, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sept. 26, 1974, Ser. No. 509,597
Int. Cl.² G03B *21/28*
U.S. Cl. 353—28 **10 Claims**



1. In an annular field projection system wherein an image is projected onto an object, a coarse viewing system for viewing the object and image thereon comprising:

a. a primary mirror and a relatively smaller secondary mirror, said mirrors having concave and convex reflective surfaces, respectively, disposed in confronting relation and concentric with respect to an optical axis, the reflective surface of the secondary mirror being formed by a dichroic beam splitting coating;

b. a short focal length objective lens disposed adjacent said secondary mirror and on the opposite side thereof with respect to said primary mirror, said lens being tilted with respect to said axis; and

c. a relay lens system for conveying the image formed by said objective lens to the eye of an operator.

3,957,365

DUPLICATING APPARATUS UTILIZING ION MODULATING MEANS AS THE IMAGE GENERATING SOURCE AND METHOD OF DUPLICATING THEREWITH

George Thomas Croft, Northfield, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed July 26, 1974, Ser. No. 492,005
Int. Cl.² G03G *15/16, 15/00*
U.S. Cl. 355—3 R **15 Claims**

1. In a duplicating apparatus for making reproductions on plain paper from a graphic original through the use of a modulator having memory retention capabilities under conditions of ambient light the combination comprising:

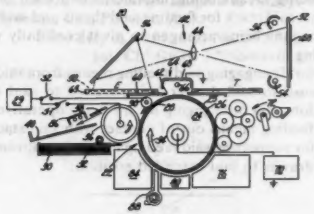
an illuminating station for receiving said graphic original in position to be illuminated for producing a pattern of light and shadow corresponding to the graphic subject matter on said original;

modulator means comprising a photoconductive screen having an insulating layer thereon which is adapted to carry a charge distribution system thereon;

means for producing said charge distribution system on said modulator comprising charging electrode means for applying a dipole charge across said insulating layer and optical means in optical communication with said illuminating station for projecting a pattern of light and shadow for producing said charge distribution system on said insulating layer, said modulator being adapted to selectively transmit therethrough charged particles;

charged particle generating means for directing charged particles toward said modulator;

image generating means comprising a compliant layer applied to a metal base and a dielectric layer applied to said compliant layer, said dielectric layer having a thickness in the range of 0.4 to 0.6 mils and a resistivity of at least 10^{14}



ohm-centimeters for attracting said charged particles in a pattern corresponding to the pattern of light and shadow, said image generating means being adapted to move in a predetermined path;

means for applying to said image generating means materials for converting said pattern to a transferrable material image;

a supply of plain paper;

a transfer station;

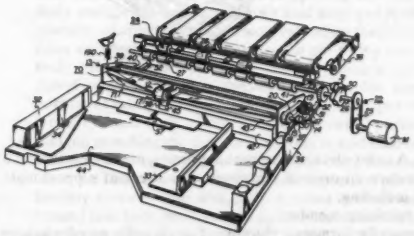
means for feeding said plain paper to said transfer station in synchronism with the movement of said image generating means in said predetermined path in order to transfer said material image to said plain paper.

3,957,366

SHEET FEEDING APPARATUS

Thomas N. Taylor, Rochester, and Wayne F. Schoppe, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 5, 1974, Ser. No. 503,583
Int. Cl.² B65H *1/04, 3/04, 5/38;* G03G *15/00*
U.S. Cl. 355—3 R **23 Claims**



1. A sheet feeding apparatus for feeding sheets from a stack comprising:

means for supporting said stack of said sheets;

means for feeding said sheets from said stack;

means for registering the lead edge of said stack on said support means, said registration means having a registration surface for engagement by said stack;

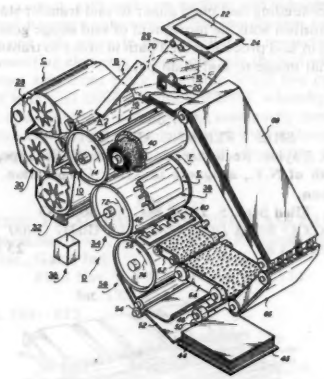
means for positioning said registration surface in an extended position for loading said stack against said surface;
means for moving said registration surface to a retracted position;
said stack support means comprising a stack support drawer which is movable between an extended position to provide across to said stack, and an operative position for feeding sheets from said stack;
said means for positioning said surface in said extended position being responsive to the movement of said drawer to said extended position;
said registration means comprising a pivotally mounted loading baffle;
said feeding means being mounted for pivotal movement against said stack for feeding said sheets and said registration means being arranged to pivot conjointly with said feeding means;
means for disengaging said feeding means from said stack in response to said drawer being moved to said extended position, said disengaging means being operative to pivot said feeding means out of contact with said stack; and
means for supporting said feeding means for movement with said drawer to said extended position.

3,957,367

COLOR ELASTROSTATOGRAPHIC PRINTING MACHINE

Narendra S. Goel, Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 16, 1974, Ser. No. 506,652
Int. Cl.² G03G *15/01*
U.S. Cl. 355—4 **15 Claims**



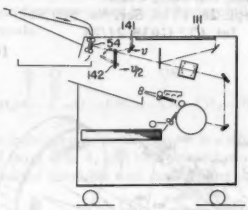
1. A color electrostatographic printing machine arranged to reproduce an original document on a sheet of support material, including:
a receiving member;
means for forming a plurality of single color powder images, in superimposed registration with one another, on said receiving member;
means for fusing the superimposed single color powder images on said receiving member producing a fused color powder image thereon; and
first means for transferring the fused color powder image from said receiving member to the sheet of support material creating a color copy of the original document thereon.

3,957,368

OPTICAL SYSTEM FOR COPYING SHEET ORIGINALS AND THICK ORGINALS

Yoshitomo Goshima, Yokohama; Hiroyuki Hattori, Mitaka; Shiro Komaba, Kawasaki, and Kazumi Umezawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 26, 1974, Ser. No. 509,744
Claims priority, application Japan, Sept. 27, 1973, 48-108677; Oct. 1, 1973, 48-111249; Nov. 30, 1973, 48-135155; Dec. 13, 1973, 48-140956; Jan. 8, 1974, 49-5503; Jan. 8, 1974, 49-5504; Feb. 12, 1974, 49-16988; Oct. 5, 1973, 48-116829[U]; Oct. 5, 1973, 48-116830[U]; Dec. 20, 1973, 48-146414[U]
Int. Cl.² G03B *27/50*
U.S. Cl. 355—8 **3 Claims**



1. A copying apparatus comprising:
sheet original transport means for transporting a sheet original;
thick original carrier means for supporting a thick original;
optical system means for projecting an image upon a photosensitive member, selectively, along a second optical path from said sheet original transport means and said thick original carrier means, said optical system means comprising first mirror means having a pair of movable mirrors for scanning a thick original supported on said thick original carrier means, and also comprising second mirror means disposed in said first optical path and having a plurality of mirrors fixedly mounted on the copying apparatus;
means for maintaining said pair of movable mirrors in respective positions outside of said first optical path between the photosensitive member and said sheet original transport means when a sheet original is to be copied, wherein mirrors disposed in said first optical path comprise only said fixedly mounted mirrors, and for positioning at least one of said movable mirrors to block said first optical path when a thick original is to be scanned by said movable mirrors; and
process means for producing copies of images projected on the photosensitive member.

3,957,369

APPARATUS FOR DRYING A WET COPY SHEET IN A COPIER

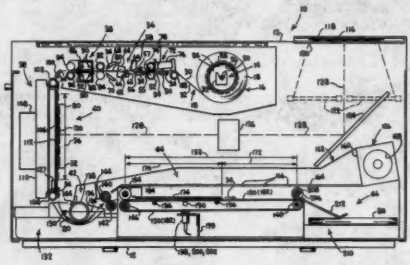
Eugene Allan Wirth, Huntington, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Sept. 24, 1974, Ser. No. 508,753
Int. Cl.² G03G *15/22*
U.S. Cl. 355—10 **7 Claims**

1. In an electrostatic copier including developing means of the type which utilizes a liquid developer to develop an electrostatic latent image on a copy sheet, whereby the copy sheet becomes wet, and including squeegee means for removing excess liquid developer from the wet copy sheet, a movable belt for carrying in surface contact therewith the squeegeed wet copy sheet in a predetermined path of travel, and means for moving the belt, improved apparatus for drying the squeegeed wet copy sheet comprising:

a. means for forming first and second drying regions in the path of travel of the squeegeed copy sheet, said forming means including a cover mounted over the belt so as to deflect air away from the first drying region, and said forming means including said belt being made of a strip of imperforate material;

b. means for heating the moving belt at the first drying region, said heating means including an electrically energizable heating device for heating the belt surface opposite to the surface thereof on which the squeegeed copy sheet is normally disposed for movement with the belt,



said belt being made of a heat conductive material to facilitate the conduction of heat through the moving belt to the squeegeed copy sheet at the first drying region, whereby the squeegeed copy sheet is heated and liquid developer carried by the squeegeed copy sheet tends to be urged toward the surface thereof which is disposed out of contact with the moving belt as the squeegeed copy sheet moves through the first drying region; and

c. means for directing air toward the second drying region to evaporate liquid developer from the heated copy sheet as the heated copy sheet moves through the second drying region.

3,957,370

COPYING DEVICE WITH A SYSTEM FOR A REFLEX EXPOSURE OF THE ORIGINAL

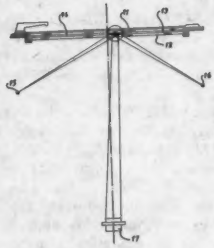
Mathias J. J. M. Vola, Sittard, Netherlands, assignor to Ocevan der Grinten N.V., Venlo, Netherlands

Filed Oct. 23, 1974, Ser. No. 517,169

Claims priority, application Netherlands, Nov. 8, 1973, 7315328

Int. Cl.² G03G *15/00*; **G03B** *27/54*, *27/62*

U.S. Cl. 355—11 **8 Claims**



1. In an apparatus for copying originals by reflex exposure, including an exposure plate to support an original thereon with its image side downwards, a plate- or sheet-like device for pressing the original against said exposure plate, light sources disposed laterally at opposite sides below said plate, said pressing device having a light reflective surface for reflecting light passed thereto through a light-transmitting original, and a lens system disposed centrally below said plate for collecting light reflected from the original or from said pressing device, the improvement which comprises a layer of transparent material disposed between said pressing device and an original on said exposure plate for broadening and thus reducing the reflection intensity of the shadow regions of image portions of the original in the exposure of a light-transmitting original.

3,957,371

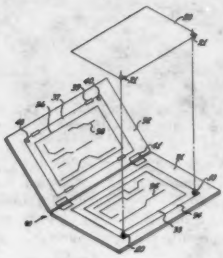
LOCATOR PIN FOR ALIGNING PRINTED CIRCUIT BOARD WITH ARTWORK

Dennis E. Rich, Phoenix, Ariz., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed July 2, 1975, Ser. No. 592,566

Int. Cl.² G03B *27/58*

U.S. Cl. 355—74 **2 Claims**



1. Apparatus for maintaining accurate registration between a circuit board on which a conductive pattern is to be formed and a printing mask containing the image of said conductive pattern, said apparatus comprising

a plate having an exposure aperture therein, said printing mask being secured to said plate over said exposure aperture, and

means affixed to said plate for detachably securing said circuit board to said plate to overlie said printing mask so that the portion of said circuit board on which said conductive pattern is to be formed is in accurate registration with said image on said printing mask, said securing means comprising a base member secured to said plate, an upright body member whose exterior is cylindrical and whose interior tapers inwardly from a free end towards said base and ends in a threaded opening therein, said body member being integral with said base and having a plurality of annularly spaced slots extending therethrough from said free end, and an expansion pin fitting into said body member, said pin being tapered along a portion therof and ending in a threaded portion, the tapered portion of said pin substantially matching the taper of the interior of said body member and the threaded portion of said pin matching the threaded opening in said base member, said expansion pin permitting said body member to assume a first cross-section when said expansion pin is not forcibly screwed into said body member and serving to expand said body member to a second cross-section when said expansion pin is forcibly screwed into said body member, said first cross-section being less than that of a predetermined opening in said circuit board so that said circuit board is easily moved relative to said body portion, and said second cross-section being at least as great as that of said opening, the relative locations of said securing means on said plate and said opening in said circuit board being such that said circuit board is maintained in accurate registration with said printing mask when said body member is expanded.

3,957,372

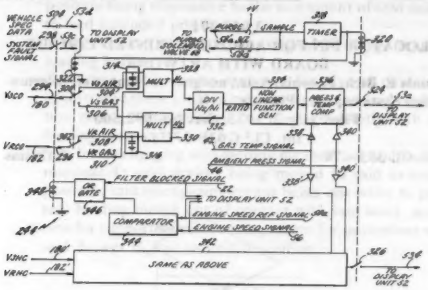
VEHICLE EXHAUST GAS ANALYSIS SYSTEM

Terence W. Jowett, Avon; Charles Myron Rabinowitz, Bloomfield, both of Conn.; Anthony D. M. Knights, Longmeadow, Mass., and Thomas A. Cross, Winsted, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1974, Ser. No. 534,495

Int. Cl.² G01N 21/24

U.S. Cl. 356—51 **16 Claims**



1. A gas analysis system for measuring the amount of a selected contaminant contained within a sample gas comprising

a gas sample cell adapted to contain a gas,

a reference cell containing a reference gas,

means for filling said gas sample cell with ambient air,

means for producing a moving beam of infrared energy and passing said beam alternately through said reference cell and said sample cell,

detector means positioned to receive said energy beam after it has passed through said cells, said detector means including filter means which transmit therethrough only a selected narrow wave band within the spectrum of said infrared energy beam, said detector means producing first and second electrical signals indicative respectively of the absorption of said infrared beam within said reference and sample cells when said sample cell contains ambient air,

means for filling said gas sample cell with a sample gas,

means for passing said moving beam of radiant energy alternately through said sample cell and said reference cell while said sample cell is filled with said sample gas, said detector means producing in response thereto third and fourth electrical signals indicative respectively of the absorption of said infrared beam within said reference and sample cells,

means including a signal processing unit for receiving said first, second, third and fourth signals and producing therefrom an output signal proportional to the concentration of said selected contaminant in said sample gas.

3,957,373

QUANTITATIVE DETERMINATION OF ELEMENTS IN ALLOYS

Kelvin Arthur Clarke, Beresfield, Australia, assignor to Commonwealth Steel Company Limited, Australia

Continuation-in-part of Ser. No. 104,913, Jan. 8, 1971, abandoned. This application June 20, 1974, Ser. No. 481,177

Claims priority, application Australia, Aug. 27, 1970, 2342/70

Int. Cl.² G01J 3/40, 3/30

U.S. Cl. 356—77 **5 Claims**

1. A method for quantitative spark emission analysis of a first element in an alloy, comprising the steps of:

a. establishing a basic calibration curve which relates a spectrometer count during a given integration time period to an actual content of said first element in a standard sample of said alloy;

b. determining an influencing factor for the effect of the presence of an influencing element in a standard sample of said alloy and relating said influencing factor to said basic calibration curve to derive a slope factor in accordance with the relation:

$$E_1 \cdot I_m \cdot F_s = E_2$$

wherein

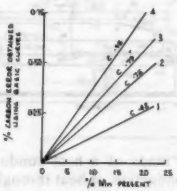
E_1 is the indicated amount of said first element obtained from said basic calibration curve;

I_m is the amount of said influencing element present in the standard sample of said alloy;

F_s is the slope factor; and

E_2 is the amount of adjustment necessary to obtain the true amount of said first element in the standard sample of the alloy;

c. spectroscopically analyzing an alloy having unknown amounts of said first element and said influencing element therein for said influencing element and for said first element during said given integration time period and deriving an indicated content of said first element from said basic calibration curve; and



d. adjusting said indicated count of said first element in said alloy by said influencing factor so as to derive an actual content of said first element in said alloy in accordance with the relation:

$$E_3 = E_1 (1 + I_m F_s)$$

wherein

E_3 is the true percentage of the first element in said alloy;

E_1 is the indicated percentage of the first element in said alloy;

I_m is the amount of the influencing element present in said alloy; and

F_s is the slope factor of the influencing element present in said alloy.

3,957,374

APPARATUS FOR OBTAINING SAMPLES OF DUSTS FOR ANALYSIS BY SPECTROCHEMICAL EXAMINATION

Manfred Kriese, Heidenheim; Jurgen Kuhl, Aalen; Siegfried Neumann, Unterkochen, and Reimund Torge, Aalen, all of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Germany

Filed Jan. 14, 1975, Ser. No. 541,049

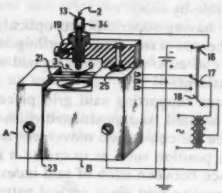
Claims priority, application Germany, Feb. 1, 1974, 2404873; July 22, 1974, 2435091

Int. Cl.² G01N 1/00; G01J 3/42

U.S. Cl. 356—85 **3 Claims**

1. Apparatus for obtaining samples of dusts for analysis by spectrochemical examination comprising a sample container, an ion generator for electrostatically charging dust particles contained in air adjacent the surface of said sample container, means for electrostatically charging the sample container positively, means for electrostatically charging the ion generator negatively, means including a circuit for heating said sample container electrically, and a double-throw switch for connecting said sample container either to a source of high voltage electric current for electrostatically depositing the dust particles on said sample container or alternatively to said

heating circuit for atomizing the deposited dust particles, said ion generator being mounted on a swivel device which allows



the ion generator to swing away to expose said sample container to a light source for spectrochemical examination of said atomized dust particles.

3,957,375

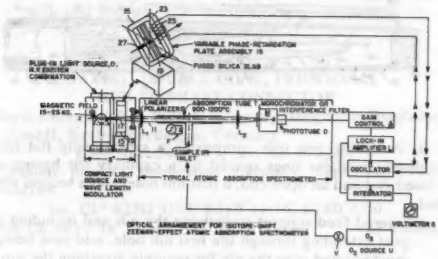
VARIABLE THICKNESS DOUBLE-REFRACTING PLATE

Tetsuo Hadeishi, Berkeley, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Continuation-in-part of Ser. No. 336,579, Feb. 28, 1973, Pat. No. 3,811,778, and a continuation-in-part of Ser. No. 442,280, Feb. 13, 1974, Pat. No. 3,914,054. This application July 23, 1974, Ser. No. 491,095

Int. Cl.² G02F 1/29

U.S. Cl. 356—85 **8 Claims**



1. Polarization modulation apparatus for use with an Isotope-Zeeman Atomic Absorption Spectrometer system employing a constant magnetic field and a single separated mercury isotope source for producing Zeeman spectral light components, comprising reference light and absorption light having different frequencies that are transmitted through a gas containing a biologically dangerous contaminant, a modulation means and a linear polarizer means so that the reference and absorption light produce a sinusoidally varying signal whose amplitude varies in accordance with the amount of said contaminant in said gas, comprising:

a. first phase-retardation plate means for receiving and selectively transmitting said light components along an axis to the linear polarization means in successive stages; and

b. means for applying selectively variable frequency pressures to said first means in said system for effecting the selective transmission of said reference and absorption light through said system along said axis in accordance with the pressures applied to said first means for facilitating the comparison of said reference and absorption light to determine the amount of said contaminant in said gas.

3,957,376

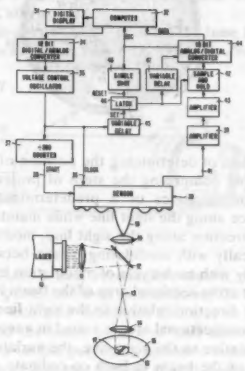
MEASURING METHOD AND SYSTEM USING A DIFFRACTION PATTERN

Ronald S. Charsky, Poughkeepsie; Gilbert E. Conn, Wappingers Falls; Alexander L. Flamholz, Monsey, and Harold J. Young, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 25, 1974, Ser. No. 436,411

Int. Cl.² G01B 9/02

U.S. Cl. 356—106 R **32 Claims**



1. A method of measuring the distance between two substantially parallel line edges on a target including:

applying a spot of collimated monochromatic radiation of a selected wavelength to a portion of the target having the two line edges which are to have the distance therebetween measured to obtain a diffraction pattern from the portion of the target illuminated by the spot;

imaging the diffraction pattern to a sensor;

controlling the time period that the sensor receives radiation from each of a plurality of positions of the diffraction pattern for conversion into separate signals related to the intensity of the radiation for each of the plurality of positions of the diffraction pattern;

periodically increasing the radiation received by the sensor from each of the plurality of positions of the diffraction pattern during the controlled time period until the contrast between at least two of the zero intensity positions and the positions of the diffraction pattern adjacent to each of the zero intensity positions is sufficient to enable the determination of the location of at least two zero intensity positions of the diffraction pattern;

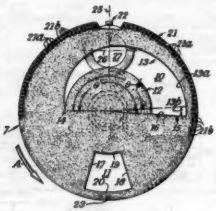
determining the locations of at least two zero intensity positions in the diffraction pattern after the diffraction pattern is imaged to the sensor and in accordance with the separate signals produced from the sensor for each of the plurality of positions of the diffraction pattern;

and obtaining the distance between the two line edges in accordance with the distance between two zero intensity positions in the diffraction pattern.

3,957,377
METHOD OF AND APPARATUS FOR SENSING THE POSITION OF A BODY

Terence Hutchinson, Belfast, Ireland, assignor to Short Brothers & Harland Limited, Belfast, Ireland

Filed Oct. 16, 1973, Ser. No. 406,864
Claims priority, application United Kingdom, Oct. 17, 1972, 47835/72
Int. Cl.² G01B 11/26
U.S. Cl. 356—152 **24 Claims**

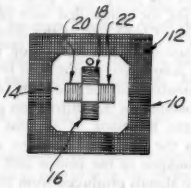


1. A method of determining the position of a body relative to a sight line comprising the steps of projecting a beam of electro-magnetic waves of a predetermined characteristic from a source along the sight line while maintaining the beam in a fixed direction along the sight line, modulating the fixed beam cyclically with modulating means between the source and the body with each cycle of modulation including a phase in which the cross-sectional area of the beam is varied in a first co-ordinate direction relative to the sight line and a phase in which the crosssectional area is varied in a second co-ordinate direction relative to the sight line, the variation of cross-sectional area of the beam in both co-ordinate directions being between a position in which no part of the beam passes the modulating means and a position in which a maximum crosssectional area of the beam passes the modulating means, sensing with a sensor of said electro-magnetic waves mounted on the body, the time periods in which the beam of electromagnetic waves is of sufficient cross-sectional area to be received by the sensor and producing sequentially, from said time periods, a first signal representative of a first co-ordinate of the position of the body within the cross-section of the beam, and a second signal representative of a second co-ordinate of the position of the body in the cross-section of the beam.

3,957,378
TWO-AXIS MOIRE FRINGE DISPLACEMENT TRANSDUCER

Richard B. Zipin, Englewood, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 25, 1974, Ser. No. 526,778
Int. Cl.² G01B 9/02, 11/02, 11/04
U.S. Cl. 356—169 **2 Claims**



1. A displacement transducer comprising:

an index piece having a plurality of index optical grating patterns formed thereon, two of said plurality of optical gratings disposed with the grating rulings extending in orthogonal directions to each other, each of said optical gratings comprised of two optical grating sets, each of said sets consisting of two parallel offset grating patterns arranged side-by-side;

a grid piece having superimposed optical grating patterns formed thereon extending in orthogonal directions to each other so as to correspond to said two index optical grating patterns;

support means supporting said grid piece and said index piece juxtaposed and positioned with respect to said index piece for constained movement relative said index piece in a position such as to create a fringe pattern by interference between each of said index optical patterns and a respective grid piece optical pattern;

means illuminating said index and grid patterns;

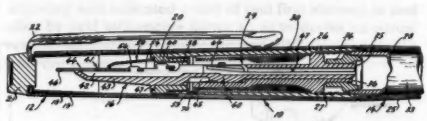
means detecting said fringe patterns and producing signals corresponding thereto;

whereby signals corresponding to relative movement between said index piece and grid piece along either of said directions are produced, and the relative phasing of patterns produced by said offset patterns in each of said optical grating sets produces signals indicative of the direction of said movement.

3,957,379
FOUNTAIN PEN

Frederick R. Wittnebert, Whitewater, Wis., assignor to The Parker Pen Company, Janesville, Wis.

Filed Apr. 4, 1975, Ser. No. 565,296
Int. Cl.² B43K 5/18
U.S. Cl. 401—239 **5 Claims**



1. A writing pen unit comprising a substantially flat nib including resilient tines spaced by a capillary slit having a closed end and an open end, a first nib hole, and a second nib hole;

a tapered feed support underlying the nib and including a post extending through the first nib hole, said post being mushroomed over the nib for securely attaching the support to the underside of the nib, the support further including a lock lug extending through the second nib hole and the lug having a deformable post extending therefrom;

a nib retainer overlying and bearing on the nib, said nib retainer having a hollowed recess facing said nib and having an opening for movement of air into the recess and a hole receiving therethrough the lock lug post, said post being mushroomed over the nib retainer for locking the nib retainer, nib and feed support together into a unit; and

means on said support for connecting said unit to a pen reservoir.

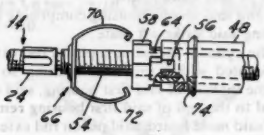
3,957,380
CLUTCH ACTUATING MECHANISM

Victor S. DeGrazia, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 413,160, Nov. 5, 1973, Pat. No. 3,859,866.
This application July 31, 1974, Ser. No. 493,424
Int. Cl.³ G05G 1/14
U.S. Cl. 403—14 **4 Claims**

1. An axially adjustable attachment means for a conduit:

a threaded conduit end;
a nut having a tool receiving portion and a cylindrical pilot portion adjacent said tool receiving portion;
said nut having a shoulder at the juncture of said tool receiving portion and said pilot portion;
said nut having a through bore threaded from one end of said bore to the other end of said bore;
said nut threadedly received on said conduit end;
said nut having an axial length less than the length of said conduit end;
said nut being axially displaceable for the full length of said conduit end prior to the assembly of said attachment means;



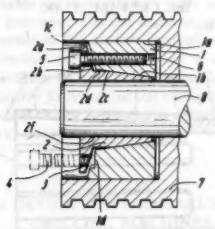
a housing having a nonthreaded internal bore concentric with respect to said cylindrical portion of said nut;
said housing bore having an internal diameter greater than the maximum external diameter of said conduit end whereby said housing is sized to pass over said conduit end without engagement therewith prior to the assembly of said attachment means;
said nut having a projection extending axially from said shoulder;
said housing having an end with a recess receiving said projection and an end surface engaging said shoulder;
resilient retaining means urging said nut into engagement with said housing.

3,957,381

COAXIAL, DOUBLE-CONE, FRICTIONAL HUB-TO-SHAFT CONNECTOR

Horst-Dieter Schäfer, Willich, Germany, assignor to Ringfeder GmbH, Krefeld-Uerdingen, Germany

Filed Apr. 30, 1975, Ser. No. 572,351
Claims priority, application Germany, Sept. 14, 1974, 2444104
Int. Cl.² B25G *3/00*; E21B *19/16*; F16D *1/00*
U.S. Cl. 403—16 **23 Claims**



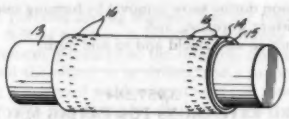
1. A clamp-action connector for establishing a frictional connection between a shaft and a collar concentric to the shaft, comprising, in combination, a flanged clamping ring having a radial flange, an unflanged clamping ring, one of said rings being received within the other; and tightening means for tightening the connector by drawing said rings together in axial direction, each of said rings having an inner surface and an outer surface, the inner surface of the outer ring and the outer surface of the inner ring being conical surfaces which engage each other when said rings are drawn together in axial direction, the other surface of at least one of said rings being a clamping surface adapted to engage with a clamp action in a complementarily configurated surface of a shaft or collar when said rings are drawn together in axial direction, said unflanged ring at the axial end thereof facing towards said flange being provided intermediate said inner surface of said unflanged ring and said outer surface of said unflanged ring with an inclined conical intermediate surface, and said flange having an inner surface which faces towards and is substantially parallel to said inclined conical intermediate surface of said unflanged ring.

3,957,382

METHOD OF PROCESSING FUSIBLE INSERTS

Walter J. Greuel, Jr., Oakland, and Stephen H. Diaz, Los Altos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 368,671, June 11, 1973, abandoned. This application June 11, 1974, Ser. No. 478,308
Int. Cl. B29c *27/00*
U.S. Cl. 403—27 **10 Claims**



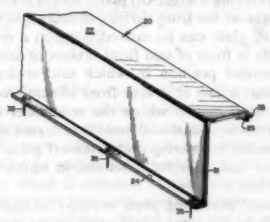
1. In combination, a heat recoverable sleeve, a substrate, said sleeve being positioned over said substrate for heat recovery into contact with said substrate, said sleeve having disposed adjacent to the inner surface of said sleeve a fusible liner comprising a fusible polymeric adhesive material having protuberances on at least one surface of said liner, said protuberances comprising a fusible material, said protuberances being of such size and shape that they form readily obvious bumps or ridges on the outer surface of the heat recoverable sleeve after it has recovered into contact with said substrate but insufficient heat has been added to cause the insert to flow and upon application of sufficient heat, said protuberances and fusible liner flow to form a complete bond between said sleeve and said substrate.

3,957,383

CURB PROTECTION DEVICE AND METHOD

Robert H. Fredericks, 1559 Connell Road, Charleston, W. Va. 25314

Filed Sept. 4, 1973, Ser. No. 393,937
Int. Cl.² E01C *11/22*
U.S. Cl. 404—8 **3 Claims**



1. A curb protection plan, for a curb alongside vehicular roadways, that provides impact resistance and protection against freezing and salt damage, comprising, in combination:
A. a unitary shield having high impact strength, toughness, and flexibility and a shape conforming generally to said curb to be protected as to size, shape, dimensions, and

curvatures, said unitary shield being a thin, flexible, tough, impact-resistance fiberglass sheet having a generally L-shaped cross section and comprising:

1. an approximately upright gutter side having a top edge and a bottom edge,
2. a generally horizontal top side extending from said top edge and having a back edge,
3. a backside rim extending downwardly from said back edge, and
4. a street rim extending from said bottom edge and disposed oppositely to said top side,

said unitary shield further comprising a plurality of shield sections which are conjoined end-to-end with a resin and fiber-glass cloth to form waterproof joints at intervals corresponding to the length of said shield sections as a part of a barrier to moisture intrusion; and

B. an underlying shock-absorbing cushion of reasonable thickness which:

1. multiplies the impact-resisting ability of said shield,
2. affords direct impact protection to said curb therebeneath,
3. isolates said curb from the effects of freezing and salt erosion during snow removal by forming said barrier to moisture intrusion, and
4. bonds to said shield and to said curb.

3,957,384

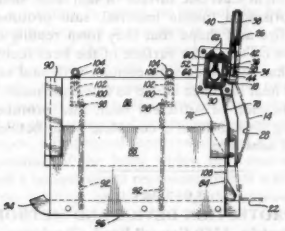
SCREED EXTENSIONS FOR PAVING MACHINES

Ronald B. Lamb, Anaheim, and David H. Williamson, Santa Ana, both of Calif., assignors to Bower Industries, Inc., Orange, Calif.

Filed Nov. 12, 1974, Ser. No. 523,029

Int. Cl.[2] E01C *19/22*

U.S. Cl. 404—118 **2 Claims**



1. A screed extension apparatus in combination with a machine for spreading pulverulent material, said machine having an elongated mold board, said mold board having a top, a bottom, ends, and a front surface, said screed extension apparatus including a strike-off plate, means for mounting said strike-off plate on the front surface of said mold board so that said strike-off plate can be moved between a retracted position generally in front of said front surface of said mold board and an extended position in which said strike-off plate is located so that a part of it is in front of said front surface of said mold board and in which the remainder of it extends outwardly from an end of said mold board, said apparatus also including means for moving said strike-off plate between said retracted and said extended positions, in which the improvement comprises:

an elongated mounting plate secured to said mold board adjacent to the top of said mold board so as to extend inwardly from an end of said mold board in front of said mold board,

a first housing having an elongated tubular shape and having a uniform cross-sectional configuration along its length pivotally mounted on said mold board adjacent to said end of said mold board and extending in front of said mounting plate,

means for rotating said first housing a limited amount relative to said mounting plate,

detachable means for securing said first housing to said mounting plate against rotation,

a second housing of uniform cross-sectional configuration along its length and having a C shape fitting around and engaging said first housing so as to be capable of only linear movement with respect to said first housing,

an adapter plate being attached to said second housing so as to extend downwardly therefrom generally in front of said mold board,

said strike-off plate being attached to said adapter plate so as to extend downwardly therefrom to adjacent to the bottom of said mold board,

said first and said second housing comprising said means for mounting said strike-off plate,

a hydraulic cylinder including a piston rod extending therefrom located within said first housing so as to extend along the interior of said first housing, said cylinder being secured to the end of said first housing remote from said end of said mold board, said piston rod extending through the end of said first housing adjacent to said end of said mold board, said piston rod being connected to said second housing,

said hydraulic cylinder and said piston rod comprising said means for moving said strike-off plate,

said strike-off plate being shorter than said adapter plate,

said cylinder being capable of being actuated so as to move said strike-off plate from a first position in which said strike-off plate is generally in front of said mold board and in which a corner of said strike-off plate is adjacent to and in front of a corner of said mold board at a lower edge of said mold board to another position in which the edge of said strike-off plate closest adjacent to the center of said mold board overlies said end of said mold board adjacent to said end of said mold board,

said end of said strike-off plate being substantially vertically aligned with the pivotal connection of said mounting plate and said first housing when said strike-off plate is in said other position.

3,957,385

TAPERED CLAMPING SLEEVE

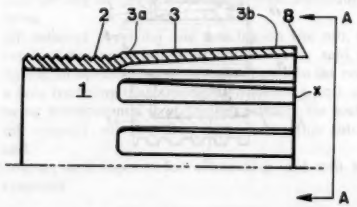
Carl Ullberg, Katrineholm, Sweden, assignor to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

Filed Apr. 9, 1974, Ser. No. 465,402

Claims priority, application Sweden, May 21, 1973, 7307093

Int. Cl.[2] F16C *35/06*

U.S. Cl. 403—370 **2 Claims**



1. An adapter sleeve for use as an adapter between the bore of a bearing and a shaft on which the bearing is mounted, the adapter sleeve comprising a substantially cylindrical wall with first and second ends, the wall being tapered along its length between said first end having first outer diameter and said second end having larger outer diameter, the sleeve wall including axially extending lands which are situated around the inner and outer circumferences and alternately project radially inward and outward respectively, said wall having sub-

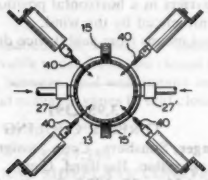
stantially constant thickness throughout, said inward projecting lands defining a substantially constant diameter bore of first inner diameter, said sleeve further comprising an annular portion which extends co-axially from said first end and has screw threads on its outer surface, said lands and taper extending axially to the terminal part of said second end.

3,957,386

CORRUGATED TUBING PERFORATING MACHINE

Manfred A. A. Lupke, 262 Royal Orchard Blvd., Thornhill, Ontario, Canada

Filed Feb. 18, 1975, Ser. No. 550,458
Int. Cl.² B29C *17/10*; B23C *1/14*; B26D *3/06*
U.S. Cl. 408—50 15 Claims



1. A machine for perforating corrugated tubing at accurately spaced locations, comprising:

a frame structure,

means for advancing the tubing along a predetermined path in intermittent steps of equal length,

releasable clamping means mounted on the frame structure and operable to clamp the tubing in a stationary position relative thereto,

the clamping means comprising a plurality of clamping members each movable between clamping and release positions and each having a clamping face matched to the corrugations of the tubing for locating the tubing positively in the stationary position,

a plurality of cutters mounted on the frame structure, each cutter being operable to move through a cutting stroke lying in a plane which is transverse to said path and intersects a valley between adjacent corrugations of the tubing when the tubing is clamped in said stationary position,

means responsive to completion of a step of said advancing means for initiating movement of the clamping members into the clamping position,

means operable in accordance with movement of the clamping members into the clamping position for initiating movement of the cutters through a cutting stroke,

means responsive to completion of a cutting stroke for initiating release of said clamping means, and

means responsive to return of the clamping members to the release positions for initiating a subsequent step of said intermittent advancing means.

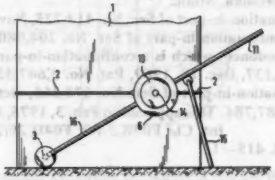
3,957,387

HOLDING DEVICE FOR MANUALLY PORTABLE DRILLING MACHINES

Egon Evertz, and Rolf Seybold, both of Solingen, Germany, assignors to Egon Evertz, Solingen, Germany

Filed Mar. 24, 1975, Ser. No. 561,314
Claims priority, application Germany, Mar. 29, 1974, 2415273
Int. Cl.² B23B *45/14*
U.S. Cl. 408—78 7 Claims

1. A holding device for manually portable drilling machines used for executing drilling operations in the exterior walls of upright, cylindrical or prismatic objects, the device including a hollow casing adapted to receive the portable drilling machine therein, said casing having an outer circumference, means carried by said casing for non-rotationally guiding the drilling machine for movement relative to the casing in a longitudinal direction toward and away from the object to be drilled, a fixed ring rigidly secured to the outer circumference of the casing, a second ring rotatably mounted about said first ring, a detachable tension element attached at two mutually opposite points to said second ring, said tension element being sufficiently long to encircle at least the horizontal circumference of the object to be drilled at the vertical level of the hole to be drilled in its wall, resilient bracing means provided between the portable drilling machine and the tension element when the drilling machine is located at a drilling site and the tension element is secured to the rotatable ring and is in tension around the object to be drilled, and a support on which the casing is mounted and having at least one runner wheel at its bottom end, a gripping handle adjacent the upper end of said support, a hub carried by said support adjacent its lower end and carrying said runner wheel, the hub extending parallel to said longitudinal direction.

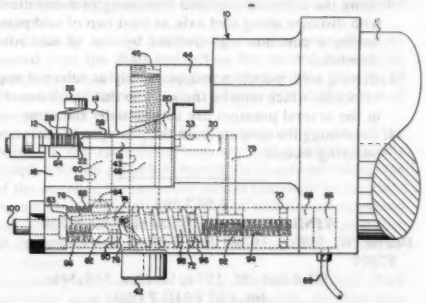


3,957,388

BORING BAR WITH REMOVABLE AND INDEXABLE CUTTING INSERT

Arne R. Jorgensen, Lombard, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 521,986, Nov. 7, 1974. This application Aug. 4, 1975, Ser. No. 601,675
Int. Cl.² B23B *31/10*
U.S. Cl. 408—240 2 Claims



1. A device for holding a removable cutting insert comprising a tool block for receiving said insert, clamp means for exerting holding pressure on said insert to hold said insert in place in said block, a hydraulic cylinder, a piston movable in a first direction in said cylinder and in a second direction in said cylinder which is opposite to said first direction in said cylinder, bias means for positioning said piston at a predetermined location in said cylinder, an actuating shaft attached to said piston, force application means actuated by the motion of said actuating shaft constructed to apply force on said clamp means when the hydraulic pressure is applied to said piston so as to move said piston in said first direction in said cylinder and to remove said force on said clamp when said hydraulic pressure on said piston is relieved so as to allow said piston to move in said second direction in said cylinder and a manual over-ride means that is depressible so as to engage said actuat-

ing shaft means and so as to force said actuating shaft sufficiently in said second direction so that the force applied by said clamp on said insert is substantially removed.

3,957,389

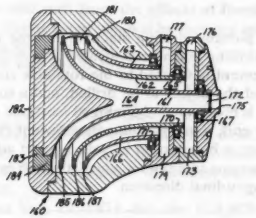
PUMPING APPARATUS AND PROCESS CHARACTERIZED BY GENTLE OPERATION

Edson Howard Rafferty, Excelsior, and Harold D. Kletschka, Minneapolis, both of Minn., assignors to Bio-Medicus, Inc., Minnetonka, Minn.

Continuation-in-part of Ser. No. 414,225, Nov. 9, 1974, which is a continuation-in-part of Ser. No. 204,980, Dec. 6, 1971, abandoned, which is a continuation-in-part of Ser. No. 886,137, Dec. 18, 1969, Pat. No. 3,647,324, which is a continuation-in-part of Ser. No. 678,265, Oct. 26, 1967, Pat. No. 3,487,784. This application Feb. 3, 1975, Ser. No. 546,770

Int. Cl.[2] F03B *5/00*; **F04D** *29/22*

U.S. Cl. 415—1 **26 Claims**



1. The method of pumping fluids without causing significant damage thereto which comprises:

1. dividing the fluid to be pumped into a plurality of independent streams;
2. accelerating the several streams by superficial contact thereof with smooth, nested, rotating members defining moving walls of a plurality of coaxial passages extending along the common axis and increasing in mean diameter with distance along said axis, at least two of said passages having a common wall defined by one of said rotating members;
3. driving said members independently at selected angular velocities which may be the same so that the flows of fluid in the several passages are substantially the same; and
4. combining the outputs from the passages to comprise the pumping output.

3,957,390

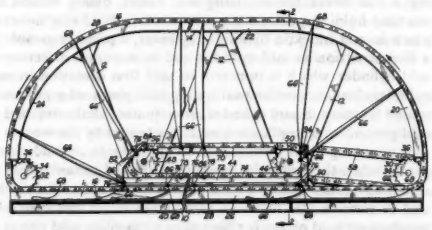
WIND DRIVEN POWER MECHANISM

Denver W. Miller, 10208 SE. Telford Road, Boring, Oreg. 97009

Filed Oct. 30, 1974, Ser. No. 519,346

Int. Cl.[2] F01D *23/00*

U.S. Cl. 415—5 **6 Claims**



1. A wind driven power mechanism comprising

a. an elongated base having forward and rearward ends and arranged to be disposed longitudinally in the direction of wind movement,

b. a first endless carrier extending longitudinally of said base and having an upper run and a lower return run,

c. a second endless carrier also extending longitudinally of said base and having an upper run and a lower return run,

d. the upper run of said first endless carrier being disposed above the upper run of said second endless carrier,

e. a plurality of flexible sail-type vane means having upper and lower ends,

f. first connecting means operably connecting said vane means to said carriers for movement along the upper runs of said carriers in an upright position for surface engagement by the wind for driving said carriers longitudinally,

g. second connecting means operably connecting said vane means to said carriers for movement along the lower runs of said carriers in a horizontal position for return movement uninfluenced by the wind,

h. and output means from said device driven by one of said carriers.

3,957,391

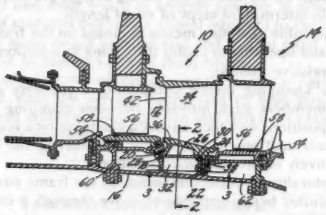
TURBINE COOLING

Gary J. Vollinger, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 25, 1975, Ser. No. 561,713

Int. Cl.[2] H01D *5/18*

U.S. Cl. 415—116 **3 Claims**



1. In the turbine section of a gas turbine engine of the type having

a plurality of nozzle guide vanes disposed circumferentially about the engine with the airfoil section of each vane extending radially inward across the path of the working medium gases flowing through the engine, and

an annular cooling air chamber located radially outward of the guide vanes between a turbine case and a deformable ring having an upstream portion encased by supporting structure, wherein the improvement comprises:

means, which are operative in response to pressure forces exerted by the working medium gases on the airfoil sections of the vanes during operation of the engine, for preventing the leakage of cooling air around the upstream portion of the ring by deforming the ring against the supporting structure.

3,957,392

SELF-ALIGNING VANES FOR A TURBOMACHINE

Ronald Blaine Blackburn, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

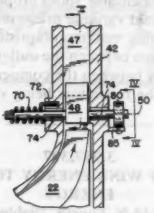
Filed Nov. 1, 1974, Ser. No. 519,985

Int. Cl.[2] F04D *27/02*, *25/10*

U.S. Cl. 415—146 **5 Claims**

1. In a turbomachine having a channel defined by spaced wall means and an impeller rotatable for inducing in the channel a fluid flow which can change direction, the improvement comprising: a plurality of fixed vanes mounted between the spaced wall means; a plurality of movable vanes each asso-

ciated with a different one of the fixed vanes and each having a closed position abutting the associated fixed vane to form effectively therewith a single fluid channeling member; mounting means movably mounting each of the movable



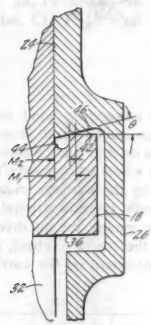
vanes between the spaced wall means for causing the fluid flow to space the movable vanes from said closed position; and spring means acting between said wall means and said movable vanes biasing said movable vanes to said closed position.

3,957,393

TURBINE DISK AND SIDEPLATE CONSTRUCTION

Donald J. Bandurick, East Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 29, 1974, Ser. No. 518,826
Int. Cl.² F01D *5/30, 5/32*
U.S. Cl. 416—220 R **8 Claims**



1. For use in gas turbine engines, a turbine wheel assembly comprising:

a plurality of turbine blades, each having a root section;

a disk having

an axis of rotation,

a face perpendicular to the axis of rotation,

a plurality of root cavities disposed about the circumference of the disk, each cavity receiving the root section of a corresponding turbine blade, and

a plurality of sideplate retaining lugs extending from the perpendicular face between root cavities, each lug having an arcuate surface facing radially inward toward the axis of rotation; and

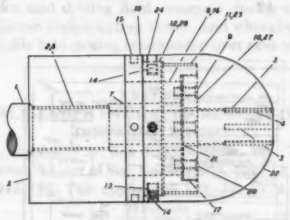
a plurality of sideplates attached to the disk, each sideplate having an inclined bearing surface which opposes and is inclined with respect to the arcuate surface of one or more disk lugs whereby line contact engagement therebetween is effected, the most radially outward point on the inclined surface being in closest proximity to the perpendicular face of the disk.

3,957,394

MARINE PROPELLER MOUNTING DEVICE

Harold Chaskin, 131 Bennett Ave., New York, N.Y. 10033

Filed Mar. 17, 1975, Ser. No. 558,793
Int. Cl.² B63H *1/20*
U.S. Cl. 416—244 B **7 Claims**



1. A marine propeller mounting device for a marine propeller driven by motive means, said mounting device comprising

a shaft coupled at one end to motive means and having an opposite free end, said shaft having external threading thereon in spaced proximate relation with the free end thereof, a plurality of keyways formed in the shaft at the free end thereof extending parallel to the axis of the shaft in spaced equiangular relation and a plurality of keys supported in said keyways;

a propeller mount supporting a marine propeller for rotation therewith, said propeller mount being coaxially positioned over the shaft and having an internally threaded axial bore threadedly coupled to the threading of the shaft and a plurality of internally threaded bores formed in an end surface thereof parallel to the axis;

a component coaxially positioned over part of the propeller mount, said component having a first part with external threading thereon, a second part having a plurality of radially extending internally threaded bores formed therein in spaced equiangular relation, and first and second adjoining axial bores formed through the component, the second bore having a larger diameter than the first, the first bore accommodating part of the propeller mount;

a substantially annular restraining member coaxially positioned over the shaft and within the second bore of the component, said restraining member having a plurality of bores formed therethrough in alignment with the bores of the propeller mount;

a plurality of screws each in a corresponding one of the bores of the restraining member and each threadedly coupled to the propeller mount via a corresponding one of the bores of the propeller mount coupling the restraining member to the propeller mount with a predetermined gap between the restraining member and the propeller mount thereby preventing axial movement of the propeller mount;

an assembly nut member having first, second and third adjoining axial bores formed therethrough, the first bore having a larger diameter than the second and the second bore having a larger diameter than the third, a plurality of radially extending internally threaded bores formed in the nut member around the first bore in alignment with the radially extending bores of the component, the second bore being internally threaded and a plurality of keyways formed in the third bore in alignment with the keys of the shaft, said nut member being threadedly coupled to the component via the externally threaded part of said component and the second bore of said nut member; and

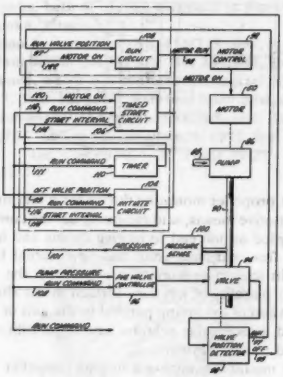
a plurality of set screws each threadedly coupled in a corresponding one of the radially extending bores of the assembly nut member and threadedly coupled in a corresponding one of the radially extending bores of the component.

3,957,395

METHOD AND APPARATUS FOR CONTROLLING A PUMP

Harold W. Ensign, Fullerton, Calif., assignor to Cla-Val Co., Costa Mesa, Calif.

Filed Nov. 25, 1974, Ser. No. 526,716
Int. Cl.[2] F04B 49/00, 49/02, 49/06, 49/08
U.S. Cl. 417—12 28 Claims



1. A pumping system comprising a

a pump having an inlet and discharge side,

a valve having an inlet connected to the discharge side of said pump and having an output side, said valve being operable between first and second positions, one of said positions being a closed position and the other of said positions being an open position,

pump stop means for initiating movement of said valve from said first position to said second position,

means responsive to attainment by said valve of a position near said second position for stopping said pump,

start means for initiating movement of said valve from said second to said first position, and

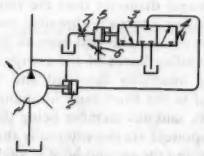
means for preventing said pump from starting unless said valve is in said second position.

3,957,396

PRESSURE CONTROL IN HYDRAULIC SYSTEMS

John Edwin Cooper, Leatherhead, England, assignor to Sperry Rand Limited, London, England

Filed Oct. 9, 1973, Ser. No. 404,742
Claims priority, application United Kingdom, Oct. 11, 1972, 46934/72
Int. Cl.[2] F04B 1/00
U.S. Cl. 417—218 5 Claims



1. A hydraulic system including a variable delivery pump drawing fluid from a sump and supplying it under pressure from the pump outlet, and having an actuating cylinder controlling the pump delivery, a load connected between the pump inlet and the sump, a pressure compensator supplying fluid to said actuating cylinder, the compensator having a compensator spool, spring means applying a force to one end of said compensator spool, a variable pressure dividing system connected between the pump outlet and the sump so as to be in parallel with the load, and means for applying a force to the other end of the compensator spool proportional to the pressure obtained from said variable pressure-dividing system,

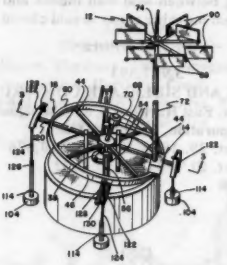
said pressure-dividing system comprising a pair of restrictors connected one between the outlet and the compensator and the other between the compensator and the inlet, at least one of the restrictors being variable.

3,957,397

CONVERSION OF WIND ENERGY TO MECHANICAL ENERGY

Clarence Wendler, 244 N. Fourth, Dighton, Kans. 67839

Filed Dec. 30, 1974, Ser. No. 537,097
Int. Cl.[2] F04B 17/00
U.S. Cl. 417—271 14 Claims



1. Apparatus for converting wind motion to mechanical motion comprising an endless track means defining an endless path, carriage means on said track means, said carriage means including a traction wheel in operative engagement with the track means whereby the carriage means can be propelled about the endless path, omnidirectional windmill means carried by the carriage means, means drivingly connecting the windmill means to the traction wheel, and an energy transducer driven by movement of the carriage means about its endless path.

3,957,398

WAVE ENERGIZED PUMP

Harold Lloyd, 67 Casselman Place, Chula Vista, Calif. 92010

Filed Sept. 3, 1974, Ser. No. 502,283
Int. Cl.[2] F04B 17/00, 35/00
U.S. Cl. 417—331 4 Claims

1. A wave energized water pumping apparatus comprising:

a. a float having horizontally elongated pontoons defining a wave channel therebetween, said pontoons being compartmented and partially filled with water as ballast;

b. a super structure connecting said pontoons and spanning said channel;

c. pumps mounted on said super structure and having wave-action-responsive actuators in said channel;

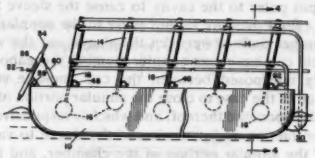
d. said pumps having inlets in said channel and outlets for connection to a utilization means;

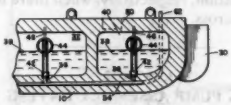
e. each of said pontoons having a conduit with stub pipes interconnecting the different compartments thereof;

f. float operated valve means controlling flow through each stub pipe;

g. said conduits being also connected with the inlets of said

pumps, so that an excess of water in any compartment opens corresponding valve means in that compartment to





maintain the water in the compartments at a common level.

3,957,399

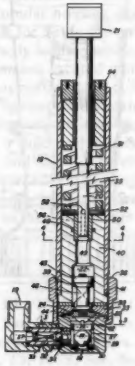
DIAPHRAGM PUMP

Bernard Siczek, La Grange Park, Ill., assignor to Graco Inc., Minneapolis, Minn.

Filed Mar. 20, 1975, Ser. No. 560,210

Int. Cl.² F04B *9/10*

U.S. Cl. 417—387 **16 Claims**



1. A diaphragm pump apparatus of the type having a mechanically reciprocating piston for alternately compressing and relaxing a driving fluid chamber acting on one side of a diaphragm and having a pumped fluid chamber on the other side of the diaphragm, comprising

a. a sleeve slidable over said piston and having at least a portion of its first edge surface area exposed to the driving fluid chamber, and having its second edge surface positioned outside said driving fluid chamber;

b. spring-biasing means for urging against said second edge surface and biasing said sleeve toward said driving fluid chamber;

c. a mechanical stop for limiting the movement of said sleeve toward said driving fluid chamber;

d. a driving fluid reservoir in fluid coupling contact with said piston outside said driving fluid chamber;

e. a replenishing passage through said piston and opening at a first point into said driving chamber and at a second point along said piston, whereby said second point may contact said driving fluid reservoir during a portion of said piston reciprocating stroke, and whereby said sleeve is slidable into closing relationship over said second point.

3,957,400

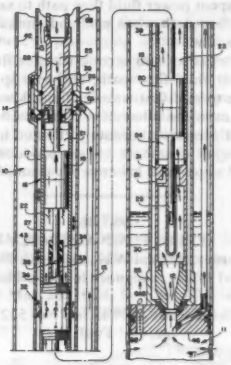
DOUBLE-ENDED HYDRAULICALLY ACTUATED DOWN-HOLE PUMP

George K. Roeder, P.O. Box 4335, Odessa, Tex. 79760

Continuation-in-part of Ser. No. 441,801, Feb. 12, 1974, Pat. No. 3,915,595. This application Oct. 29, 1974, Ser. No. 518,373

Int. Cl.² F04B *17/00*

U.S. Cl. 417—393 **11 Claims**



2. A hydraulically actuated downhole pump assembly comprising a main body having upper and lower cylindrical chambers spaced from one another by a control valve assembly;

said upper and lower cylindrical chambers, respectively, having upper and lower pistons, respectively, reciprocatingly received therein; a hollow connecting rod connected to said upper and lower pistons and adapted to stroke with the pistons in either of two opposed directions, a marginal intermediate portion of said connecting rod being received through said control valve; means by which reciprocal action of said rod controls the action of said control valve;

said upper piston dividing said upper cylinder chamber into an upper production chamber and a lower engine chamber;

said lower piston dividing said lower cylinder chamber into an upper engine chamber and a lower production chamber;

a balance tube, a marginal free lower end portion of said hollow rod being received within said balance tube;

means including a flow conduit forming a formation fluid inlet through part of said main body and into said upper and lower production chambers so that formation fluid from a production formation can flow thereinto; means including a flow conduit forming a produced fluid outlet through part of said main body and from said upper and lower production chambers so that produced fluid can flow from said downhole pump;

a seal tube connected to said control valve assembly, a port formed in said rod; a marginal length of said rod, including said port, being received in spaced relation within said seal tube;

means forming a power fluid flow path which extends into said main body, into said hollow rod, through said upper piston, through a marginal length of said connecting rod to said port formed within said rod where the fluid branches into two paths and one path flows into said rod seal tube and to said control valve assembly while the other flow path continues through the hollow rod and into said balance tube;

means forming a first transfer fluid flow path connected from said control valve to said lower engine chamber; means forming a second transfer fluid flow path connected from said control valve to said upper engine chamber;

means forming a spent power fluid flow path connected to flow from said control valve, into flow communication with said produced fluid outlet;

and means responsive to reciprocal movement of said connecting rod for causing said control valve to connect said first transfer fluid flow path to said power fluid flow path, and said spent power fluid flow path to said second transfer fluid flow path when said rod strokes in one of two directions; and,

to connect together said second transfer fluid flow path to said power fluid flow path, and said spent power fluid flow path to said first transfer fluid flow path when said rod strokes in the other of two directions;

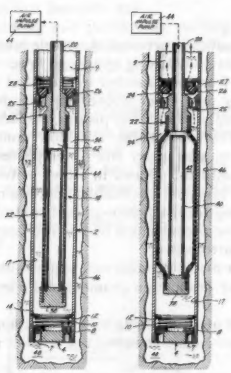
so that fluid pressure alternately effected in said lower and upper engine chambers causes produced fluid to flow from said upper and lower production chambers.

3,957,401

FLUID PUMP ASSEMBLY

Gerald T. Sweeney, Federal Way, and Keith Blackburn, Enumclaw, both of Wash., assignors to Tigre Tierra, Inc., Puyallup, Wash.

Filed Dec. 16, 1974, Ser. No. 532,836
Int. Cl.[2] F04B 9/10
U.S. Cl. 417—395 **10 Claims**



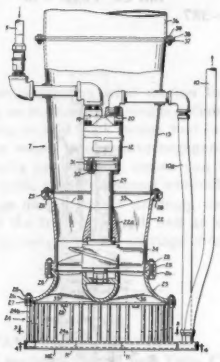
1. In a pump assembly, a case having a head wall and a surrounding body wall defining a chamber which is open at one end thereof, a thimble-like pulse generating member in the chamber, comprising an elongated, resiliently flexible sleeve which is connected at one end to the head wall of the case and cantilevered toward the open end of the chamber in spaced relationship to the surrounding body wall of the case, and a cap which is disposed on the other end of the sleeve to form an enclosed cavity therewithin, and pulse generating means interconnected with the member to apply a fluid pressure input pulse to the cavity to cause the sleeve to flex and impart a fluid pressure output pulse to the annular portion of the chamber defined between the sleeve and the walls of the case, said cap having an annular member thereabout which is movably interposed between the cap and the surrounding body wall of the case to close the annular portion of the chamber to the open end thereof, and which is responsive to lengthwise contraction and extension of the sleeve to vary the volume of the annular portion of the chamber, and there being inlet and outlet openings in the cap and one of the walls of the case, respectively, for transmission of fluid into and out of the annular portion of the chamber, and check valve means adjacent the inlet and outlet openings, which are operative to limit the fluid flow therethrough to relatively inward and outward of the chamber portion, respectively, when there is a pressure differential thereacross.

3,957,402

DEWATERING PUMP ASSEMBLY HAVING A HEAT EXCHANGER

Albert H. Sloan, 4201 Kean Road, Fort Lauderdale, Fla. 33314

Division of Ser. No. 415,997, Nov. 15, 1973, Pat. No. 3,910,728. This application Feb. 6, 1975, Ser. No. 547,378
Int. Cl.[2] F04B 17/00
U.S. Cl. 417—367 **7 Claims**



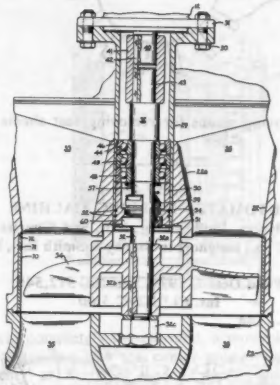
1. Dewatering pumping apparatus comprising, a power source, a fluid tank assembly including a pressure fluid pump connected to and driven by said power source, a pump assembly for being located in a hole to be dewatered and including a housing having a lower end, a pressure fluid motor carried by said housing, fluid conduits connected between said motor and said tank assembly for conducting pressure fluid therebetween to drive said motor, an impeller in said housing and connected to said motor for being rotationally driven by said motor to thereby pump water from said hole, said pump assembly having a heat exchanger fixed to said lower end of said housing and including a chamber for receiving pressure fluid, and conduit fluid means connecting said, fluid motor and said heat exchanger.

3,957,403

DEWATERING PUMP ASSEMBLY

Albert H. Sloan, 4201 Kean Road, Fort Lauderdale, Fla. 33314

Division of Ser. No. 415,997, Nov. 15, 1973, Pat. No. 3,910,728. This application Dec. 27, 1974, Ser. No. 536,831
Int. Cl.² F04B 9/08; F01D 1/02
U.S. Cl. 417—390 4 Claims



1. A dewatering pump assembly comprising a generally tubular housing, said housing having stator means therein, a bearing housing in said tubular housing and mounted on said stator means and concentrically with said tubular housing, a fluid motor connected to one end of said bearing housing, a pump shaft extending through said bearing housing and connected at one end to said fluid motor, a water pumping impeller in said generally tubular housing and secured to the other end of said pump shaft for being driven by said fluid motor, a tubular seal holder snugly located within said bearing housing, anti-friction bearing means located within said bearing housing for rotationally supporting said pump shaft therein, said seal holder abutting against said bearing means, and a mechanical rotary sliding seal in and supported by said seal holder and providing a fluid seal between the interior of said bearing housing and said shaft, whereby water is prevented from entering the interior of said bearing housing, said interior of said bearing housing being pressurized with fluid pressure from said fluid motor to thereby prevent leakage of water past said bearing means.

3,957,404

VANES FOR FLUID POWER CONVERTER

Charles R. Gerlach, San Antonio, Tex., assignor to Rineer Hydraulics, Inc., Corpus Christi, Tex.

Filed Mar. 13, 1975, Ser. No. 558,088
Int. Cl.² F01C 1/00; F03C 3/00; F04C 1/00
U.S. Cl. 418—150 4 Claims

1. In a fluid power converter having a rotor member and a stator member, the members being rotatable one with respect to the other and having coacting peripheries forming an annular fluid space therebetween, each of the members including a plurality of radially extending vane slots, the improvement in the vanes positioned in each slot comprising,

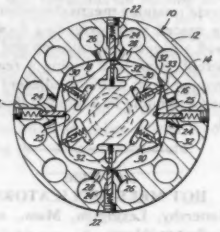
said vanes being generally rectangular in cross section,

the outer edges of the vanes which extend into the annular space having a convex curved shape,

the convex shape of the stator vanes forms a discontinuous surface with the inner periphery of the stator and the convex shape of the rotor vanes forms a discontinuous surface with the outer periphery of the rotor,

the radial extent of the convex shape of the stator vanes plus the radial extent of the convex shape of the rotor vanes being at least equal to the minimum radial clearance between the rotor and stator thereby preventing rotor and stator vanes from catching on each other during rotation,

the radial extent of the convex shape of each stator vane being no greater than one fourth of the stator vane thickness, and the radial extent of the convex shape of each



rotor vane being no greater than one fourth of rotor vane thickness thereby preventing undesirable detenting between the rotor and stator vanes during rotation,

the maximum slope of the convex shape of the rotor vanes being at least equal to the maximum slope of the stator periphery adjacent the annular fluid space, and

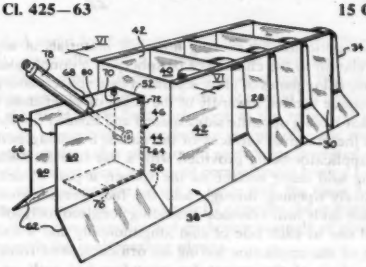
the maximum slope of the convex shape of the stator vanes being at least equal to the maximum slope of the rotor periphery adjacent the annular fluid space.

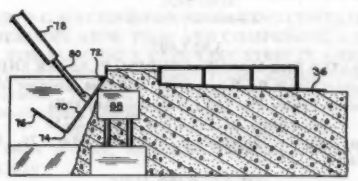
3,957,405

SLIP FORM HAVING HINGED GATE MEANS

Roy R. Goughnour, Jackson, Mich., assignor to A. C. Auker-man Co., Jackson, Mich.

Filed May 28, 1974, Ser. No. 473,345
Int. Cl.² B28B 13/02
U.S. Cl. 425—63 15 Claims





1. A slip form for forming concrete walls comprising, in combination, an elongated wall forming form having spaced side walls defining a cavity, an open front end, an open rear end and an open bottom, a concrete receiving hopper defined at said form front end in communication therewith, said hopper having a front wall, an opening defined in said front wall

in alignment with the length of said form cavity capable of receiving stationary objects to be molded into the wall, said opening having upper and lower portions and lateral edges, an access door located adjacent said hopper front wall selectively movable between open and closed positions with respect to, at least, said opening's upper portion selectively providing access to said hopper and form cavity for stationary objects to be molded into the wall, operating means connected to said door for translating said door between said open and closed positions, concrete retaining means comprising a pair of vertically extending spaced walls extending forwardly from said hopper front wall adjacent said opening and located on each lateral side thereof, each wall having a rear edge disposed adjacent said hopper front wall and adjacent a lateral edge of said opening and extending in a forward direction away from said front wall.

3,957,406

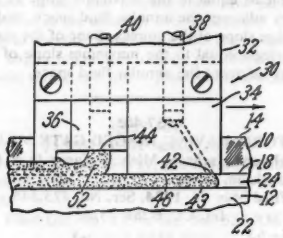
HOT MELT APPLICATORS

William R. Battersby, Lexington, Mass., assignor to USM Corporation, Boston, Mass.

Continuation of Ser. No. 363,363, May 24, 1973, Pat. No. 3,868,805, which is a division of Ser. No. 137,274, April 26, 1971, Pat. No. 3,759,771. This application Feb. 28, 1975, Ser. No. 554,157

Int. Cl.² B28B *11/04*

U.S. Cl. 425—87 **4 Claims**



1. An applicator for flowing hot melt materials in superposed relation to the channeled periphery of a double glazing unit comprising panes of glass separated by a spacer having an outer surface located inwardly of the edges of said panes, said applicator having opposite sides spaced and formed for sliding fit with the marginal surfaces of the panes, a leading portion of the applicator being provided with a flat face for slidably engaging said outer surface of the spacer, a pair of orifices respectively opening through said flat face progressively to force hot melt into recesses extending longitudinally of the channel one at each side of said longitudinally and a trailing portion of the applicator having an orifice spaced from the outer surface of the spacer for extruding hot melt on the material deposited from said pair of orifices.

3,957,407

APPARATUS FOR MANUFACTURING PLASTER SHEETS

John Robert Gault, Baulkham Hills, Australia, assignor to ACI Technical Centre Pty. Ltd., Waterloo, Australia

Filed Mar. 26, 1975, Ser. No. 562,239

Claims priority, application Australia, Mar. 26, 1974, 7034/74

Int. Cl.² B28B *23/02*

U.S. Cl. 425—126 R **13 Claims**

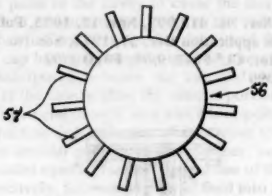
1. Apparatus for the continuous manufacture of fibre reinforced plaster sheet, including:

a plurality of sheet casting moulds;

endless conveying means supporting said moulds;

a casting station having slurry casting means for casting slurry into said moulds as they pass;

a fibre station, having fibre disposing means for disposing reinforcing fibres across the surface of the cast slurry and fibre forcing means to force the fibres into the slurry; and



sheet removing means for removing cast sheets from the moulds.

3,957,408

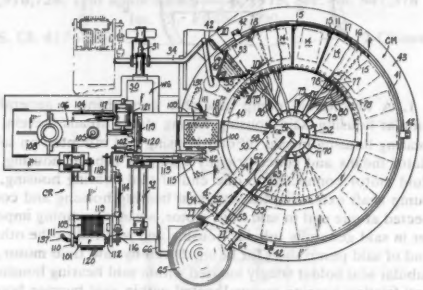
AUTOMATED MOLDING MACHINE

Wilbur L. Clymer, Phillipsburg, N.J., and Charles J. Klara, Bethlehem, Pa., assignors to Binney & Smith Inc., New York, N.Y.

Filed Oct. 7, 1974, Ser. No. 512,545

Int. Cl.² B29C *5/00*

U.S. Cl. 425—144 **15 Claims**



1. A molding machine comprising, a horizontally rotatable mold table having a plurality of compartments, at least one mold tube traversing vertically each compartment, means for supplying molding material to said mold tubes, means for controlling the temperature in each compartment, a transfer mechanism adapted to receive molded products and to convey them away from the mold table, first ejection means for removing molded products from the mold tubes and placing them in the transfer mechanism, and drive means for moving the mold table, transfer mechanism and ejection means.

3,957,409

MEANS FOR CREATING PERFORATED CONCRETE CASING

Gottlieb W. Grosch, Silver Creek, Nebr. 68663

Filed Dec. 24, 1974, Ser. No. 532,763

Int. Cl.² B28B *7/18*

U.S. Cl. 425—171 **7 Claims**

1. A device for forming perforated concrete casings

a turntable means,

a cylindrical canister having upper and lower ends, inside and outside surfaces, said canister being removably mounted on said turntable means,

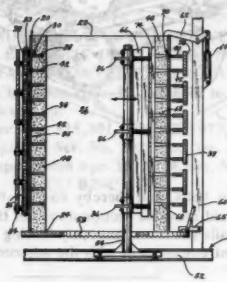
means for placing a layer of stiff concrete adjacent the inside surface of said canister,

said canister having a plurality of spaced-apart rows of elongated openings formed therein, the elongated openings in each row being horizontally disposed and verti-

cally spaced, said rows extending completely around said canister,

a first support secured to the outside surface of said canister adjacent each row of openings,

a plurality of vertically spaced plates mounted on each of said first supports and being selectively movable into and out of the openings of the associated row of openings so that perforations may be created in the concrete to form a perforated concrete casing having perforations formed



therein completely therearound, a movable second support extending into the center area of said canister, a plurality of vertically spaced apart wedge members mounted on said second support, and means for moving said second support towards said canister to cause said wedge members to penetrate the concrete to create perforations therein, said wedge members extending into the perforations created in the concrete by the plates on the said first supports.

3,957,410

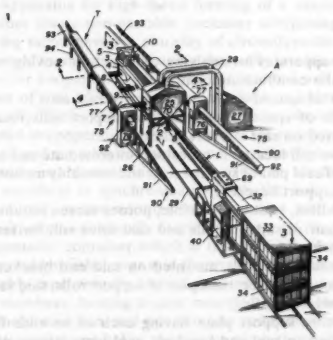
MEANS FOR CENTRIFUGALLY CASTING A PLASTIC TUBULAR MEMBER

William B. Goldsworthy, Palos Verdes Estates, and Ethridge E. Hardesty, Pine Valley, both of Calif., assignors to Goldsworthy Engineering, Inc., Torrance, Calif.

Filed Apr. 14, 1972, Ser. No. 244,189

Int. Cl.[2] B29C *5/04;* **B29D** *23/08*

U.S. Cl. 425—183 **22 Claims**



1. Apparatus for making a filament reinforced tubular member, apparatus comprising a die forming element having a shape similar to that of the reinforced tubular member to be produced, a lance member extendable into said die forming element, filament feeding means carried by said lance member for applying a continuous filament strand to said die forming element, first powered means enabling a relative rotation between said filament feeding means and said die forming element, second powered means enabling a relative reciprocation to exist between said filament feeding means and said die forming element, resin matrix feeding means operatively associated with said filament feeding means and being carried by said lance member for adding a resin matrix to the filament strands, particulate matter feeding means also carried by said lance member for adding an inert particulate matter to the filament strands, particulate matter retaining means operating associated with said apparatus for holding an amount of particulate matter, outlet means forming part of said retaining means for discharging a portion of the particulate matter from the retaining means, switch means operated associated with said outlet means and being located to be actuated by said lance member, so that upon actuation said outlet means will open and discharge a portion of the particulate matter for introduction into said particulate matter feeding means, and means for curing the composite structure.

3,957,411

MOLD

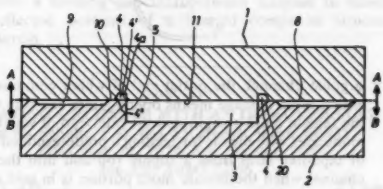
Walter Hugo Schiesser, Zurich, Switzerland, assignor to Schiesser AG, Zurich, Switzerland

Filed July 15, 1975, Ser. No. 596,058

Claims priority, application Switzerland, Aug. 21, 1974, 11400/74

Int. Cl. B29c *11/00;* **B29h** *3/06*

U.S. Cl. 425—215 **9 Claims**



1. A mold for fabricating articles formed of a fluent material, especially rubber, comprising at least two mold parts enclosing a mold compartment, said at least two mold parts being separable from one another at a mold parting plane, one of the mold parts being provided at the region of the mold parting plane with a tear groove surrounding the mold compartment, the other of the mold parts being provided with said mold compartment, said mold compartment having a marginal rim, said tear groove having an inner wall, the inner wall of the tear groove being located exactly opposite the marginal rim of the mold compartment and enclosing an angle of about 90° or less with the mold parting plane.

3,957,412

CUPPING MACHINE FOR PRODUCING CONTAINERS IN THERMOPLASTIC FILM AND COMPRISING A DEVICE FOR PLACING A TAPE-LIKE STRIP IN A MOLD

Raymond Lechevallier, Potigny, France, assignor to Ste. D'Application Plastique, Mecanique et Electronique Plastimecanique, Courbevoie, France

Filed Dec. 11, 1974, Ser. No. 531,685

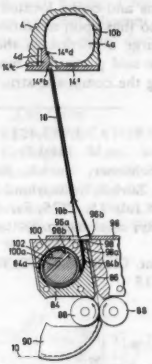
Claims priority, application Germany, Dec. 19, 1973, 2363020

Int. Cl.[2] B29C *3/00*

U.S. Cl. 425—296 **10 Claims**

1. In a cupping apparatus wherein cup-like containers are formed in a web of heated thermoplastic film, said containers having tape-like strips sealed to the outer side walls thereof, said apparatus comprising at least one mold element including a male portion and a female portion, each of said mold portions disposed on opposite sides of said heated web of thermoplastic film, means for intermittently advancing said film be-

tween said mold portions, means for displacing said female portion of said mold along a path transverse to the film between a first position wherein the female portion is separated from the male portion and a second position wherein the two mold portions mate to form a cup-like container in the film disposed therebetween and improved means for inserting said tape-like strip into said female mold portion such that the tape-like strip is positioned along the periphery of the inner wall of the female mold portion, which tape-like strip is sealed onto the outer side walls of the container formed upon mating of the male and female mold portions, the improvement comprising:



a. a guide channel, the outlet end of which communicates with a mold passage means opening into the side wall of the female mold portion and the inlet end of which communicates with means for feeding a predetermined length of tape-like strip from a supply roll and into the guide channel when the female mold portion is in said second mating position;

b. means adjacent the inlet end of the guide channel for cutting said tape-like strip from the supply roll after the tape-like strip is fed into the guide channel; and

c. means for advancing the cut tape-like strip from the guide channel and inserting the tape-like strip into the female mold portion via said mold passage means when the female mold portion is in the first position.

3,957,413

APPARATUS FOR PRODUCING HIGH-SPEED PRODUCTION OF A PRESSURE GENERATING PRODUCT

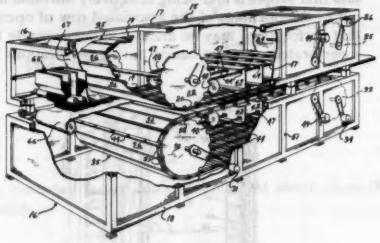
Abraham Buddy Lieberman, 4755 Boulevard des Grandes Prairies, St. Leonard, (Montreal 457), Quebec, Canada

Filed Jan. 25, 1974, Ser. No. 436,658

Int. Cl.² B29C *3/00*

U.S. Cl. 425—371 **4 Claims**

1. An apparatus for producing high-speed continuous production of a pressure generating product comprising a main conveyor unit, upper and lower main parallel conveyors secured in said main conveyor unit, said upper and lower main parallel conveyors comprising upper and lower endless platen belts, made from platen sections, and extending parallel with one another and engaged and operated at a predetermined rate of speed by driven sprocket outer main endless roller bearing link-chains, longitudinal movable sectional rails secured to the undersides of said platen sections and movable therewith and in longitudinal engagement with one another, longitudinal fixed rails secured in said main conveyor unit and located in alinement with said movable sectional rails, intermediate conveyors secured within said main conveyor unit and located within each of said upper and lower endless platen belts and formed of sprocket-driven inner parallel endless roller bearing link-chain units in rolling contact between said movable rail sections and said fixed rails and engaged and operated at a predetermined increased rate of speed in relation to the predetermined rate of speed of said upper and



lower platen belts, and thereby causing frictional relief between the said movable sectional rails of the platen belts and said fixed rails and simultaneously forcing each platen ahead for abutment engagement with the adjacent platen section.

3,957,414

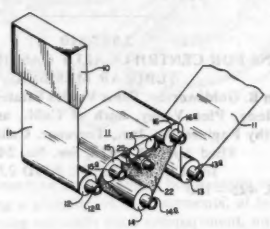
APPARATUS FOR EMBOSSED FILM MANUFACTURE

Francis H. Bussey, Jr., Rosedale, and James K. Rutherfoord, Terre Haute, both of Ind., assignors to Ethyl Corporation, Richmond, Va.

Filed Oct. 11, 1974, Ser. No. 514,240

Int. Cl.² B29C *7/22*

U.S. Cl. 425—384 **7 Claims**



1. In an apparatus for applying vacuum to a moving web of material, the combination comprising:

a. a pair of spaced apart end support brackets;

b. a pair of spaced apart, hollow support rolls rotatably mounted on said support brackets;

c. a drive roll located in a position intermediate and to one side of said pair of support rolls and rotatably mounted on said support brackets;

d. an endless, seamless, flexible, porous screen mounted on said pair of support rolls and said drive roll for rotation therewith; and

e. a vacuum assembly mounted on said end brackets and positioned between said pair of support rolls, said vacuum assembly including,

i. a bottom support plate having each of its ends fixedly attached to said end brackets, said plate having at least one opening therein,

ii. a vacuum conduit connected to said opening in said plate,

iii. a pair of spaced apart, cylindrical seal tubes rotatably supported by said bottom support plate, each of said seal tubes rotatably contacting the underside of said screen,

iv. a seal retainer strip mounted on each edge of said bottom support plate and entending outwardly therefrom and making sealing contact with the one of said pair of seal

tubes lying adjacent the respective edge of said bottom support plate,

v. a movably mounted deckle member adjacent each end of said seal tubes, said deckle member making sliding, sealing contact with said bottom support plate, both of said seal tubes and the underside of said screen to provide a vacuum chamber underlying that portion of said screen lying between the lines of contact made on the underside of said screen by said seal tubes.

3,957,415

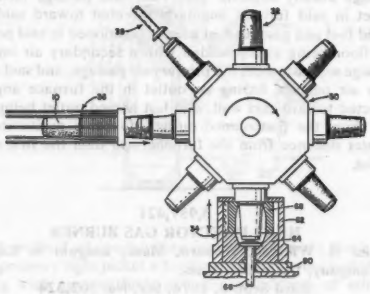
METHOD AND APPARATUS FOR CONVERTING NESTABLE PLASTIC CONTAINERS INTO NON-NESTABLE CONTAINERS PRODUCTS

Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 325,301, Jan. 22, 1973, and a continuation-in-part of Ser. No. 102,736, Dec. 30, 1970, abandoned. This application Apr. 15, 1974, Ser. No. 461,033

Int. Cl.[2] B29C *17/00*

U.S. Cl. 425—387 B **3 Claims**



1. Apparatus for high-speed forming of a nestable plastic container into a non-nestable container comprising, a rotary indexing turret having a plurality of circumferentially spaced male mold members each having thermally insulated shoulder means for cooperating solely with the internal wall of the rim portion of one of said nestable containers to releasably mechanically lock the nestable containers thereto, means mounted in cooperation with said turret for receiving a nested stack of said nestable containers and for telescopically depositing said nestable containers one at a time on successive male mold members in synchronization with the indexing of the rotary turret, means mounted in cooperation with said turret for positively mechanically forcing the internal rim portion of each nestable container which is telescopically deposited on a male mold member over said thermal insulated shoulder into releasably mechanically locked position relative to the male mold members, heating means mounted within each of said male mold members and operating to conductively heat said nestable containers below the rim portions thereof cooperating with said thermally insulated shoulder means when releasably mounted on a respective male mold member to a temperature where the nestable containers below said rim portions are readily deformable, and means mounted in cooperation with said turret for pressure-forming each heated nestable container below said rim portion to a non-nestable container while the container is releasably locked relative a respective male mold member.

3,957,416

APPARATUS FOR MAKING COMPOSITE STRUCTURES

Charles E. Kaempen, Orange, Calif., assignor to Kaempen Industries, Inc., Orange, Calif.

Division of Ser. No. 161,536, July 12, 1971, Pat. No. 3,787,441. This application Sept. 24, 1973, Ser. No. 399,986

Int. Cl.[2] B65H *81/00*

U.S. Cl. 425—470 **5 Claims**

1. An apparatus for forming a composite structure thereon comprising

a mandrel comprising separable parts releasably attached together in axial alignment by fastening means, said mandrel mounted on a longitudinal axis thereof and having an annular cross section throughout its length,

at least one pair of annular support means spaced apart longitudinally on the periphery of one of the parts of said mandrel,

each of said support means extending radially outwardly from said axis and terminating at a convex surface,

the radial heights of said support means being sufficient to form a forming gap therebetween adapted to receive deflected portions of a formed composite structure therein.

3,957,417

HEATING ORCHARDS WITH AN IMPROVED FUEL

Marvin M. Schultz, P.O. Box 11, Buena, Wash. 98921

Filed Apr. 12, 1974, Ser. No. 460,354

Int. Cl.[2] A01G *13/06*

U.S. Cl. 431—2 **2 Claims**

1. A method of heating orchards comprising:

providing an orchard heater for combusting an air-fuel mixture, and

combusting a fuel mixture in the heater consisting essentially of a hydrocarbon fuel selected from a group consisting of diesel oils, heating oils and gasoline, and a highly refined, petroleum derived, aliphatic, hydrocarbon solvent additive having a distillation range of from 316°F. to 360°F., the volume ratio of additive to fuel ranging from 1 part additive to 6–15 parts fuel.

3,957,418

METHOD AND AN APPARATUS FOR PERFORMING CLOSED COMBUSTION

Naoyasu Sata, No. 80, Yamate-cho, Ashiya, Hyogo, Japan

Filed Apr. 28, 1975, Ser. No. 572,106

Claims priority, application Japan, May 9, 1974, 49-50746

Int. Cl.[2] F23J *5/02*

U.S. Cl. 431—9 **17 Claims**

1. A method for performing combustion, employing a combustion system of the closed circulation type having a combustion means and means to lead the exhaust gas produced from the combustion means to a cleaning means for removal of oxidant constituents from the exhaust gas, which comprises:

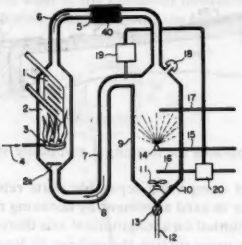
while excluding the entry of air into the combustion system, carrying out the steps of

supplying the oxygen required for combustion into the cleaning means from a pure oxygen source provided outside of the system,

mixing said oxygen with cleaned exhaust gas within the cleaning means to form an oxygen-containing gas which is capable of supporting combustion and is essentially free of nitrogen,

supplying a fuel into the combustion means from outside the system,

feeding the oxygen-containing gas to said combustion means and effecting combustion of the fuel with said oxygen-containing gas,



feeding the exhaust gas from said combustion means to said cleaning means and therein removing oxidants therefrom to form said cleaned exhaust gas, and

discharging excess exhaust gas contained in the cleaning means to the outside of the system to maintain the pressure of the oxygen-containing gas fed to said combustion means at a value capable or providing stable combustion conditions.

3,957,419

FLUIDISED BED COMBUSTION SYSTEM

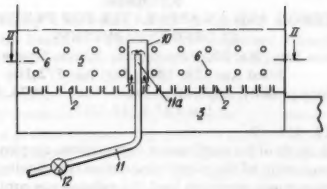
Edwin Charles McKenzie, London, England, assignor to Babcock & Wilcox Limited, London, England

Filed Dec. 16, 1974, Ser. No. 533,457

Claims priority, application United Kingdom, Dec. 17, 1973, 58377/73

Int. Cl.² F23D *19/02*

U.S. Cl. 431—170 **5 Claims**



1. A furnace having a fluidised bed, walls forming the lateral boundaries of an upright space within the bed and so disposed relatively to the floor of the bed as to provide an opening through which material from the bed outside the space can flow upwardly into the space, a material discharge pipe leading from a level within the space above the opening down through the floor of the furnace, means for supplying fuel to the bed outside the space, and means for supplying air to the bed so that air is discharged into the space.

3,957,420

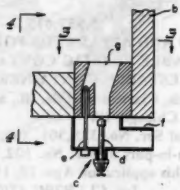
LOW NO_x EMISSION BURNERS

Minoru Asai, Kamagaya; Takehiro Takamoto, Yokohama; Mikio Ikeda, Machida, and Eiji Irahara, Tokyo, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1974, Ser. No. 533,305

Int. Cl.² F23C *5/20*

U.S. Cl. 431—175 **4 Claims**



1. A low NO_x emission burner and furnace construction wherein the furnace is provided with a floor and an upstanding wall, the floor being provided with a primary air injection passage closely adjacent said wall, said passage having an outlet in said furnace angularly directed toward said wall, liquid fuel and gaseous fuel nozzles positioned in said passage, the floor being also provided with a secondary air injection passage separate from the primary air passage, and said secondary air passage having an outlet in the furnace angularly directed toward said wall, said last named outlet being separate from the first named outlet and being positioned at a greater distance from the furnace wall than the first named outlet.

3,957,421

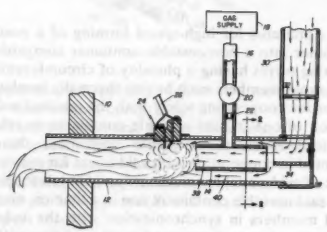
HEAT INJECTOR GAS BURNER

Ernest H. Wikman, Woburn, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sept. 3, 1974, Ser. No. 502,324

Int. Cl.² F23D *15/02*

U.S. Cl. 431—353 **2 Claims**



2. A gaseous fuel burner comprising the combination of an elongate tubular casing having an end wall at one end, an ignitor supported within said casing at a point intermediate its ends, an openended tubular flame holder disposed within the casing between the ignitor and the end wall, means for injecting gaseous fuel into the flame holder, duct means for directing a stream of air into said casing adjacent said end wall and substantially perpendicular to the axis of the casing, and regulating means spaced from said flame holder and disposed within the casing between said end wall and adjacent end of the flame holder for redirecting said air flow through both the casing and the flame holder and for regulating the quantity of air flowing respectively through and externally of the flame holder, said regulating means having a cupped air-deflecting

surface means facing said duct means for directing a major portion of the incoming air from the duct through said flame holder and a minor portion thereof through the casing along the outside of the flame holder.

3,957,422

METHOD AND DEVICE FOR THE PERIPHERAL HEATING OF MINERAL SUBSTANCES IN SHAFT FURNACES WITH FLUID FUELS AND AIR

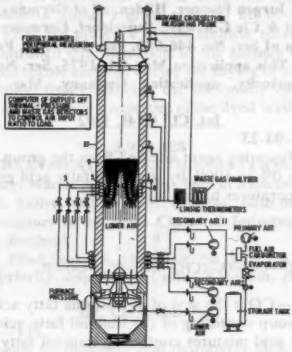
Georg Bernhard Köhn, 34a Fitgerweg, 2102 Hamburg 93, Germany

Filed Jan. 23, 1975, Ser. No. 543,533

Claims priority, application Germany, Jan. 24, 1974, 2403347

Int. Cl.² F27D *1/16*; F27B *15/00*; F27D *1/08*

U.S. Cl. 432—3 **36 Claims**



1. A method of constructing in a shaft furnace having an outer pressure tight jacket a heating device, for the peripheral heating with gaseous fuels and air shaft-fillings of mineral substances, comprising the steps of:

providing at least two identical pipes in an integral intimately adjacent parallel alignment;

radially bending said pipes into an arcuate segment for a horizontal assembly of a plurality of such segments into a ring conforming with the inner periphery of said shaft;

closing each said pipe at its end;

providing each of said at least two pipes with a line of outlet orifices in intimate proximity to each other in horizontal planes, aligned vertically and directed toward the inside of said arcuate segments for radial planar expulsions separately of streams of gas and air, respectively, and with exterior inlet orifices for the introduction of gas and air to their respective pipes through said jacket from the outside.

3,957,423

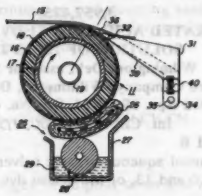
STRIPPER FINGER DESIGN

Karl J. Mueller, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 8, 1974, Ser. No. 431,641

Int. Cl.² G03G *13/08*; B05C *11/00*

U.S. Cl. 432—60 **5 Claims**



3. Apparatus for contact fusing of toner images to copy paper, said apparatus comprising:

a heated roll structure;

a backup roll structure forming a nip with said heated roll structure through which the copy paper passes with said toner images contacting said heated roll structure;

means contacting said heated roll structure for stripping of said copy paper from said heated roll structure and causing said copy paper to move thereacross; and

means for lessening the contact forces between said stripper means and said heated roll structure as said copy paper normally contacts said stripping means.

3,957,424

ENZYME-ACTIVATED OXIDATIVE PROCESS FOR COLORING HAIR

Eugene Zeffren, Montgomery, and John Francis Sullivan, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 193,182, Oct. 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 88,143, Nov. 9, 1970, abandoned. This application Sept. 13, 1974, Ser. No. 505,698

Int. Cl.² A61K 7/13

U.S. Cl. 8—10.2 **15 Claims**

1. A process for coloring hair comprising contacting hair with an effective amount of a solution containing from about 0.01 ppm to about 500 ppm of soybean peroxidase enzyme, from about 0.01% to about 1.0% by weight of hydrogen peroxide and from about 0.001% to about 6% by weight of an aromatic compound which is a primary oxidation dye precursor and having a pH of from about 4 to 10.

3,957,425

CONCENTRATED ACID RED 151 DYE-SURFACTANT SOLUTION OF 15 TO 25%

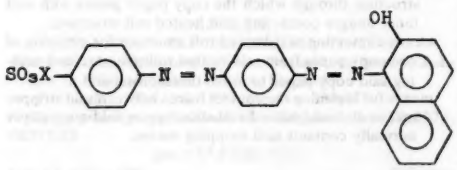
Victor Tullio, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 19, 1974, Ser. No. 462,395

Int. Cl.² D06P 1/00, 1/39

U.S. Cl. 8—41 B **5 Claims**

1. An improved aqueous-organic solvent solution having a pH between 10 and 13, of the disazo dye



wherein X is a cation selected from the group sodium, potassium, lithium, and ammonium, the improvement comprising the presence in the dye solution of a combination of

i. 0.1% to 10.0%, by total weight, of an anionic surfactant, and

ii. 0.1% to 3.0%, by total weight, of a nonionic surfactant,

the ratio of anionic surfactant to nonionic surfactant being between 1 to 10 and 17 to 1, the dye solution having a dye concentration in the range of 15% to 25% based on the total weight of the solution, said solution being nongelling upon dilution with water,

the anionic surfactant being a water-soluble salt of a substituted-benzene or -naphthalenesulfonic acid wherein the substituents are 1 to 3 alkyl groups of C_1 to C_{14},

the nonionic surfactant being selected from at least one member of the group consisting of condensates of

a. C_4 to C_{24} alkyl primary amines and at least 5 moles of propylene oxide,

b. C_4 to C_{24} alkyl primary amines and at least 5 moles of ethylene oxide,

c. C_{12} to C_{24} alcohols and at least 15 moles of ethylene oxide,

d. C_{12} to C_{24} alcohols and a least 5 moles of propylene oxide,

e. C_4 to C_{24} alcohols and at least 8 moles ethylene oxide and 2 moles of propylene oxide,

f. alkyl phenols and at least 8 moles of ethylene oxide, and

g. ethylene oxide-propylene oxide copolymer having a molecular weight from about 1,000 to 10,000 and a proportion derived from ethylene oxide of 20 to 80 weight percent.

3,957,426

FATTY ACID ESTER MIXTURES LIQUID AT LOW TEMPERATURES AND PROCESS

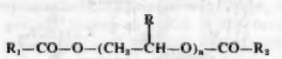
Gerhard Dieckelmann, Hilden; Helmut Hartmann, Langenfeld, and Jurgen Plapper, Hilden, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Division of Ser. No. 446,680, Feb. 28, 1974, Pat. No. 3,910,972. This application Mar. 21, 1975, Ser. No. 560,333 Claims priority, application Germany, Mar. 8, 1973, 2311344

Int. Cl.² C14C 9/02

U.S. Cl. 8—94.23 **10 Claims**

1. A fat-liquoring agent selected from the group consisting of (a) from 0% to 100% by weight of fatty acid esters liquid at low temperatures having the formula



wherein $R_1—CO$ is the acyl of at least one fatty acid selected from the group consisting of (a) train-oil fatty acids and (b) liquid fatty acid mixtures containing train-oil fatty acids and containing from 10% to 60% by weight of polyunsaturated fatty acids having 20 to 24 carbon atoms, $CO—R_2$ is the acyl of at least one liquid fatty acid substantially free of any polyunsaturated train-oil fatty acids and having more than 75% by weight of unsaturated fatty acids selected from the group consisting of (i) monounsaturated fatty acids having 10 to 22 carbon atoms (ii) diunsaturated fatty acids having 10 to 22 carbon atoms, and (iii) mixtures thereof, R is a member selected from the group consisting of hydrogen and methyl, and *n* is an integer from 1 to 10, with the proviso that up to 20 mol percent of either $R_1—CO$ or $CO—R_2$ can be replaced by hydrogen, (b) from 0% to 100% by weight of the sulfation products of said liquid fatty acid esters having a degree of sulfation of from 15% to 60%, and (c) from 0% to 100% by weight of the sulfonation products of said liquid fatty acid esters having a degree of sulfonation of from 15% to 60%, with the proviso that the total of (a), (b), and (c) is 100% by weight.

3,957,427

CONTROL OF DYE MIGRATION BY TREATING TEXTILE WITH AQUEOUS DYE BATH CONTAINING AN AMIDE DERIVATIVE OF POLYVINYL METHYL ETHER/MALEIC ANHYDRIDE

Richard F. Chambers, Pompton Lakes, N.J., assignor to GAF Corporation, New York, N.Y.

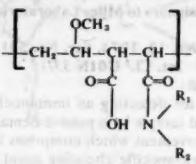
Filed Dec. 3, 1973, Ser. No. 421,130

Int. Cl.² D06P 1/52

U.S. Cl. 8—62 **9 Claims**

1. In an aqueous dye bath liquid suitable for the impregnating of textile material with said dye, the improvement comprising the incorporation in said dye bath of a polymeric antimigration additive in an amount within the range of from about 0.05% to about 0.50% by weight, based on the total

weight of said dye bath, said additive being the amide derivative of poly (vinyl methyl ether/maleic anhydride) having the structural formula:



in which R_1 and R_2 are each taken from the group consisting of H, CH_3, CH_2CH_3, $CH(CH_3)_2$ and $CH_2CH_2CH_3$ with the exception that R_1 and R_2 together may be a divalent unit taken from the group consisting of $-(CH_2)_{4-6}$ and $(-CH_2CH_2)_2O$, the poly(vinyl methyl ether/maleic anhydride) having a specific viscosity of from about 0.75 to about 4.5 measured at a concentration of about 1 gram per 100 ml of methylethyl ketone at 25°C, the presence of said additive serving to minimize uncontrolled dye migration to the surface of the dye-impregnated textile material during the drying of said material prior to fixing, thus enhancing the uniformity of the dyeing operation and the color properties of the dyed textile material.

3,957,428
TREATMENT OF TEXTILE MATERIALS

John Massey; Martin Alan Shepley, both of Runcorn, England; Roger N. Suiter, and John M. Murphy, both of Charlotte, N.C., assignors to Imperial Chemical Industries Limited, London, England

Filed Sept. 20, 1972, Ser. No. 290,738

Claims priority, application United Kingdom, July 5, 1972, 31477/72

Int. Cl.² D06L *3/02*

U.S. Cl. 8—111 **17 Claims**

1. A process for uniformly and thoroughly bleaching textile material having contaminate in the fibers comprising:
   1. impregnating the contaminated textile material with a solution of a surface-active agent in a hydrocarbon or halogenated hydrocarbon solvent and steaming the impregnated textile material to remove solvent, whereby substantially all of the contamination in the fibers and the surface-active agent remain in the textile material;
   2. impregnating the textile material with the contamination and surface-active agent with an aqueous bleaching solution containing, as a bleaching agent, hydrogen peroxide;
   3. steaming the textile material; and
   4. washing the textile material with an aqueous medium.

3,957,429
PROCESS FOR THE PRETREATMENT OR FINISHING OF MATERIALS WITH APPLICATION OF A SHORT LIQUOR RATIO

Willi Leutenegger, Bottmingen; Jakob Bühler, Muttenz; Jürgen Markert, Basel, and Jacques Zurbuchen, Pratteln, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 18, 1974, Ser. No. 480,455

Claims priority, application Switzerland, June 28, 1973, 9421/73

Int. Cl.² D06P *5/04*

U.S. Cl. 8—169 **12 Claims**

1. A process for the treatment of materials with processing agents dissolved or dispersed in water or in organic solvents, wherein the material is contacted with said processing agents in a material to liquor ratio of from 1:0.5 to 1:5 with a treatment liquor consisting of two fluid portions wherein that portion containing the processing agents constitutes the volumetrically smaller part, and the remaining portion of this treatment liquor consists of at least one aliphatic, cycloaliphatic or aromatic inert organic compound, which is perfluorinated or mixed halogenated or which contains a perfluorinated or mixed halogenated radical, said inert organic compound being immiscible with the portion containing the processing agent and said portion containing the processing agent optionally also containing additional auxiliaries that do not form an emulsion with said inert organic compound, the system being very thoroughly mixed during the treatment process.

3,957,430
PROCESS FOR THE COLOURATION OF ACRYLIC FIBRES

Brian Hewitt, Crewe; Cyril Hobday, Manchester; James Jack, Bramhall, and John Francis Edmund Keenan, Cheadle, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

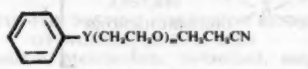
Filed Jan. 15, 1975, Ser. No. 541,190

Claims priority, application United Kingdom, Jan. 18, 1974, 2468/74

Int. Cl.² D06P *5/06*

U.S. Cl. 8—172 R **14 Claims**

1. A process for the colouration of polyacrylonitrile fibres which comprises printing or pad-steaming said fibres with a cationic dye in the presence of a carrier consisting of at least one compound having the formula



(1)

in which Y is an oxygen or sulphur atom and *m* is a number from 1 to 2.

3,957,431
PROCESS FOR EASY-CARE FINISHING CELLULOSICS

Panemangalore S. Pai, Charlotte, N.C.; Harro Petersen, Frankenthal, and Friedrich Klippel, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 28, 1975, Ser. No. 563,179

Int. Cl.² D06M *13/34*

U.S. Cl. 8—182 **8 Claims**

1. In a process for the easy-care finishing of cellulosic textile material by impregnating said material with an aqueous solution of aminoplast-forming substances and drying and fixation, the improvement which comprises diminishing the release of free formaldehyde from the finished material by spraying or slop padding said material, after impregnation and drying, with an effective amount of an essentially aqueous 2 to 60% strength by weight solution of a formaldehyde acceptor in the form of a compound which has a molecular weight of less than 200 and contains the group

wherein X is —**0**—, —NH— or —CH_2— and Y is **0**, NH or S.

3,957,432
AQUEOUS PITUITOUS COLOR COMPOSITIONS BASED ON POLY(ETHYLENE OXIDE)

William Collier Kuryla, St. Albans, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 26, 1974, Ser. No. 445,886

Int. Cl.² D06P *1/613;* **C09B** *67/00*

U.S. Cl. 8—93 **2 Claims**

1. A color composition comprising an aqueous mixture of water containing from 0.05 to 50 weight percent of dyestuff, and from about 0.5 to about 10 weight percent of a poly(ethylene oxide) homopolymer having an average molecular weight of from about 400,000 to about 10,000,000; said weight per-

centages based on the weight of said composition; and said composition having a Brookfield viscosity of from 100 cps to 10,000 cps and a pituity such that it exits in a string like manner from the vessel used to apply it to the substrate.

3,957,433

DYEING ADDITIVES

James Nairn Greenshields; George Hull, and Bernard Tury, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

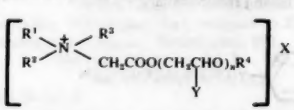
Filed Apr. 22, 1974, Ser. No. 463,127

Claims priority, application United Kingdom, May 14, 1973, 22785/73

Int. Cl.² D06P 5/04

U.S. Cl. 8—169 6 Claims

1. A process for dyeing shaped articles made of polyacrylonitrile, copolymers or blends thereof, with cationic dyestuffs characterised in that the dyeing is carried out in the presence of a quaternary ammonium compound of the formula:



wherein R^1, R^2 and R^3 represent alkyl or alkenyl groups and R^4 represents an alkyl group or hydrogen, at least one of said groups R^1, R^2, R^3 and R^4 having at least eight and not more than eighteen carbon atoms and the remainder from 1 to 4 carbon atoms, X represents an anion, Y represents hydrogen or methyl and n is zero or an average of from 1–30, wherein the amount of quaternary ammonium compound used is from 16% to 0.5% by weight of the shaped article.

3,957,434

COLORING SYNTHETIC FIBERS WITH DIPHENYLCARBINOL DYEING ASSISTANTS

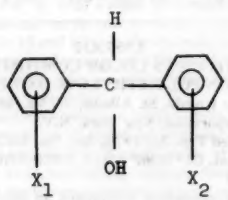
Kurt A. Dellian, and Jayanti V. Isharani, both of Greensboro, N.C., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 16, 1974, Ser. No. 532,964

Int. Cl.² C09B 67/00; D06P 1/64, 5/04

U.S. Cl. 8—173 5 Claims

1. In a process for dyeing polyester or synthetic polyamide textile fibers with a dyestuff using a carrier, the improvement which comprises conducting said process in the presence of a carrier composition which is 40 to 90% by weight a diphenylcarbinol carrier of the formula



wherein X_1 and X_2 are independently selected from the group consisting of hydrogen, halogen and lower alkyl.

3,957,435

PASSIVE HEMAGGLUTINATION TEST METHOD AND COMPOSITION FOR USE THEREIN

Ernest Clarence Adams, and Howard Raymond Teeter, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Dec. 12, 1974, Ser. No. 531,974

Int. Cl.² G01N 33/16

U.S. Cl. 23—230 B 28 Claims

1. In a method for detecting an immunochemically active substance in a fluid sample by a passive hemagglutination test reaction, the improvement which comprises including in said test reaction a ferric-specific chelating agent.

3,957,436

RESULTANT COLOR STEP INDICATOR

Dennis M. Murray, Golden Valley, Minn., assignor to Kallestad Laboratories, Inc., Chaska, Minn.

Filed Apr. 29, 1974, Ser. No. 464,986

Int. Cl.² G01N 31/22, 33/16

U.S. Cl. 23—230 R 10 Claims

HGH FLOW CHART

Steps of Procedure	Reagent Color	Background	Tube 0	Tubes A-E	Patient Sample
HGH Buffer (ml)		0.20	0.20	0.10	0.10
HGH Standards (ml)		—	—	0.10	—
Patient Sample (ml)		—	—	—	0.10
Antiserum to HGH (ml)		—	0.10	0.10	0.10
Incubate 2 hrs. at 37°C		—			
[125]-HGH (ml)		0.50	0.50	0.50	0.50
Incubate 1 hr. at 37°C					
Precipitating Antiserum (ml)		0.20	0.20	0.20	0.20
Incubate 2 hrs. at 37° C					
Centrifuge at 3000 x g at 4°C		30 min.	30 min.	30 min.	30 min.

1. In a chemical process wherein a plurality of substances are to be mixed with a test substance in a sequence of discrete steps, the improvement comprising:

color coding 2 or more of the plurality of substances, each with a different inert color; and

sequentially mixing each of the plurality of substances with the test substance and any substances mixed with the test substance in previous steps, so that the addition of each color coded substance is effective to change the cumulative color of the previously mixed substances in an identifiable manner whereby the resultant color of the mixture after each addition of a color coded substance is a conclusive indication that the step of adding the color coded substance has been completed.

3,957,437

METHOD FOR DETECTION OF GLYCOLATES

Eleanor V. Crabtree, Towson, and Edward J. Poziomek, Bel Air, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 238,711, March 23, 1972, Pat. No. 3,903,080, which is a continuation of Ser. No. 854,811, Aug. 29, 1969, abandoned. This application May 17, 1974, Ser. No. 470,779

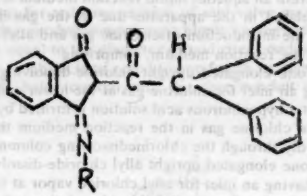
Int. Cl.² G01N 21/06, 33/16

U.S. Cl. 23—230 B 6 Claims

1. A method for detecting the presence of glycolate compounds comprising:

a. collecting a sample of a material suspected of containing a glycolate compound on a substrate,

b. spraying onto the said sample on said substrate, a solution of a detecting compound having the generic structural formula



wherein R is a member selected from the group consisting of amino and imino, said solution containing a solvent for said detecting compound,

c. allowing said solvent to vaporize,

d. viewing the substrate resulting from (c) in ultraviolet light; and

e. concluding a positive test when a fluorescence in a color spectrum from yellow to reddish-orange is observed.

3,957,438

DETECTING FLUORITE IN A SOLID ROCK SAMPLE

Wilmot P. Reid, Golden, Colo., assignor to Lost River Mining Corporation Limited, Toronto, Canada

Filed May 24, 1974, Ser. No. 472,954

Int. Cl.² G01N *31/22, 33/24*

U.S. Cl. 23—230 R **3 Claims**

1. A method of detecting the presence of fluorite in a solid rock sample comprising the steps of:

a. activating and solubilizing only the surface fluorite by applying to the surface of the rock sample a sodium cation exchange resin reagent,

b. substituting the sodium ions of the NaF of the activated and solubilized fluorite with a rare earth element,

c. reacting the thus obtained rare earth fluoride with an alizarin complexone to colour stain the rock at the site of the solubilized fluorite whereby the presence of the fluorite is readily detected.

3,957,439

SURVEYING CONSTANT VALUE CONCENTRATIONS OF HYDROCARBONS IN GROUND WATERS

B. Osborn Prescott, Houston, Tex.; Gordon Rittenhouse, deceased, late of Houston, Tex. (by Myrtle L. Rittenhouse, executrix); Arley Walters, and Harold L. Wise, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Sept. 22, 1975, Ser. No. 615,869

Int. Cl.² B01D *19/00;* G01N *33/24*

U.S. Cl. 23—230 EP **10 Claims**

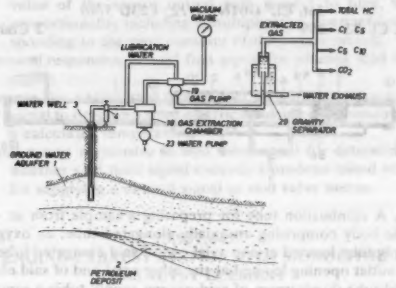
1. A geochemical exploration process comprising:

flowing successive portions of ground water from a selected subsurface location within the natural habitat of the ground water to a nearby surface location at rates sch that each portion arrives without significant chemical change;

flash distilling gas inclusive of substantially all materials more volatile than water from successive arriving portions of the ground water substantially as soon as those portions reach the surface location;

periodically measuring hydrocarbon concentrations inclusive of those of at least one hydrocarbon higher than methane in successively accumulated slugs of the gas substantially as soon as the slugs accumulate; and

indicating as the hydrocarbon concentration of the ground water in the selected location a value that remains substantially constant throughout a plurality of the measurements.



3,957,440

APPARATUS FOR TESTING CORROSION RESISTANCE OF WORKPIECE SURFACES

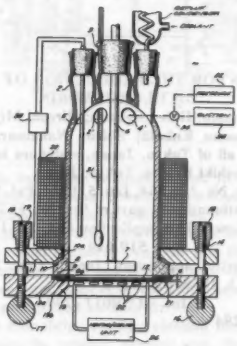
Klaus Aussieker, Munchenstein, Switzerland, assignor to Rudolf Wechsler, Birsfelden, Switzerland

Filed June 27, 1975, Ser. No. 590,856

Claims priority, application Switzerland, June 28, 1974, 8947/74

Int. Cl.² G01N *17/00, 33/20*

U.S. Cl. 23—253 C **14 Claims**



1. An apparatus for testing the resistance of a workpiece surface to a corrosive flowable medium, especially a liquid, said apparatus comprising:

a vessel of a material resistant to corrosion by said medium and adapted to receive said medium, said vessel being formed with an opening and an annular external bead surrounding said opening;

a pair of clamping members receiving said workpiece between them, one of said members annularly engaging said bead; and

releasable tightening means for drawing said members together, thereby retaining said workpiece across said opening and securing said workpiece to said vessel.

3,957,441

COMBUSTION TUBE

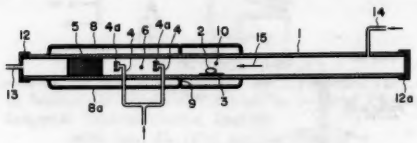
Shigeo Baba, No. 7649, Fuchuh, Tokyo, Japan

Filed Dec. 10, 1973, Ser. No. 423,100

Claims priority, application Japan, Dec. 11, 1972, 47-124138

Int. Cl.² G01N 31/12; F23D 3/40

U.S. Cl. 23—259 2 Claims



1. A combustion tube for preparing a sample from an organic body comprising an axially elongated tube; an oxygen supply tube located at one axial end of said elongated tube; a gas outlet opening located at the other axial end of said elongated tube downstream of said oxygen supply tube; a sample heating space within said elongated tube downstream of said oxygen supply tube; a combustion station downstream of said sample heating space and including at least one oxygen supply tube having a plurality of capillary apertures formed therein for the oxygen to flow therethrough said plurality of capillary apertures being symmetrically disposed about and close to the longitudinal axis of said elongated tube; a high-heating part downstream of said at least one oxygen supply tube comprising a platinum net; heating means surrounding said sample heating space said combustion station and said high-heating part, said heating means comprising a first heating wire wound about one part of said elongated tube, and a second heating wire wound about another part of said elongated tube; a covering surrounding said heating means mounted on said elongated tube for preventing heat release therefrom; and a barrier plate mounted inside said covering for thermally insulating said first wire from said second wire, said barrier plate thermally dividing said one and said another part of said elongated tube.

3,957,442

APPARATUS FOR THE PRODUCTION OF GLYCEROL DICHLOROHYDRIN

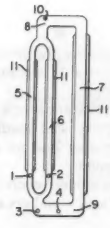
Hiroaki Yamamoto; Hideo Harada; Hiroshi Miyaoka; Minoru Tanaka; Osamu Kubota; Shizuo Nakamura, and Yasusi Nakamura, all of Tokyo, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 215,564, Jan. 5, 1972, Pat. No. 3,859,367, which is a continuation-in-part of Ser. No. 867,635, Oct. 20, 1969, abandoned. This application Oct. 31, 1974, Ser. No. 519,614

Claims priority, application Japan, Oct. 23, 1968, 43-77201; Oct. 23, 1968, 43-77202

Int. Cl.² B01J 1/00

U.S. Cl. 23—284 11 Claims



1. An apparatus for producing glycerol dichlorohydrin by the reaction of allyl chloride with chlorine in the presence of water, wherein an aqueous liquid reaction medium is continuously circulated in the apparatus due to the gas lift effect caused by the introduction of chlorine gas and allyl chloride vapor into the reaction medium, comprising:

at least one elongated upright chlorine-dissolving column having an inlet for chlorine gas at the lower end thereof so that a hypochlorous acid solution is formed by dissolving the chlorine gas in the reaction medium that flows upwardly through the chlorinedissolving column;

at least one elongated upright allyl chloride-dissolving column having an inlet for allyl chloride vapor at the lower end thereof so that an allyl chloride solution is formed by dissolving the allyl chloride in the reaction medium that flows upwardly through the allyl chloride-dissolving column, said allyl chloride-dissolving column and said chlorine-dissolving column being isolated from each other so that the chlorine gas in said chlorine-dissolving column does not contact the allyl chloride vapor in said allyl chloridedissolving column, and vice versa;

an upright reaction column whose upper end is connected by first passage means only to both the upper end of said chlorine-dissolving column and the upper end of said allyl chloride-dissolving column, and whose lower end is connected by second passage means only to both the lower end of said chlorine-dissolving column and the lower end of said allyl chloride-dissolving column, whereby the reaction medium containing the hypochlorous acid solution leaving the upper end of said chlorine-dissolving column and the reaction medium containing the allyl chloride solution leaving the upper end of said allyl chloride-dissolving column mix and flow through said first passage means and thence downwardly through said reaction column and react to produce a reaction medium mixture containing glycerol dichlorohydrin solution and said reaction medium mixture then flows through said second passage means to the lower ends of said chlorine-dissolving column and said allyl-chloride dissolving column and then upwardly therein as the reaction mediums;

outlet means for continuously withdrawing a portion of the reaction medium mixture containing glycerol dichlorohydrin solution from the apparatus;

and water inlet means for introducing water into the apparatus to make up for the reaction medium mixture containing glycerol dichlorohydrin solution withdrawn from the apparatus.

3,957,443

FLUID CATALYTIC CRACKING OF HYDROCARBON

John C. Strickland, and Dorrance P. Bunn, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 345,036, March 26, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,748

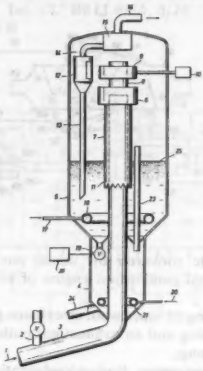
Int. Cl.² B01J 8/24; C10G 11/18

U.S. Cl. 23—288 S 7 Claims

1. In a fluidized catalytic cracking vessel comprising an enclosed, vertical shell defining a lower zone for a dense phase fluidized catalyst bed and an upper zone for separation and recovery of hydrocarbon vapors, an elongated riser conduit extending vertically into the lower portion of said reactor vessel forming an upwardly directed confined cracking path, an elongated downcomer, open at each end, vertically disposed around the upper portion of said elongated riser conduit forming a downwardly directed annular cracking path communicating at the lower end with the interior of said reactor vessel, and flow reversal means communicating with the interior of said riser conduit and the annular space between said riser conduit and said downcomer at the upper end thereof; the improvement which comprises:

a. valve means, having full open and full closed positions coaxial with the upper end of said riser conduit and communicating between the flow reveral means and the reactor vessel for selectively lengthening and shortening the confined cracking path;

b. means for reducing erosion of said valve means by impinging catalyst comprising a nipple having a diameter at least equal to the diameter of said riser conduit and having a height at least equal to one-fourth its diameter, said nipple being coaxial with the riser conduit outlet and



attached to the top of said flow reversal means and the bottom of said valve means; and

c. dense phase fluidized catalyst bed level adjusting means for selectively covering and uncovering said downcomer outlet with accumulated dense phase fluidized catalytic cracking catalyst.

3,957,444

CONTROL SYSTEM FOR EXHAUST GAS PURIFYING DEVICE

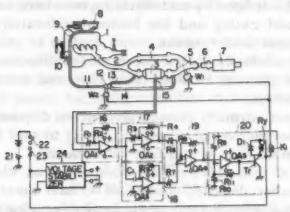
Kenji Goto, and Norio Shibata, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 319,682, Dec. 29, 1972. This application Dec. 27, 1974, Ser. No. 536,985

Claims priority, application Japan, May 16, 1972, 47-47729

Int. Cl.² B01J *8/02*; F01N *3/10, 3/15*

U.S. Cl. 23—288 FA **9 Claims**



1. In a gas purifying system of the type having a catalytic converter for purifying gas from a source, the improvement comprising a temperature control system, said system including:

by-pass means for directing a predetermined portion of said gas to be purified away from said purifying means;

valve means for blocking or opening the by-pass means;

temperature sensor means being disposed in said catalytic converter for producing an electrical output corresponding to the temperature of the catalytic converter, said temperature sensor means having a time constant associated therewith;

means responsive to said sensor means for producing a first electrical signal directly proportional to the output of said sensor means;

means responsive to said first signal means for producing a second electrical signal proportional to the differentiated value of the sensor output with respect to time, said proportionality including a multiplicative constant corresponding to the time constant of the sensor means;

means responsive to said first signal for phasing said first signal;

means for adding said phased first signal and said second signal to develop a third electrical signal corresponding to a calculated temperature;

and means responsive to said third signal for determining whether said third signal exceeds a predetermined value for supplying a control signal to said valve means.

3,957,445

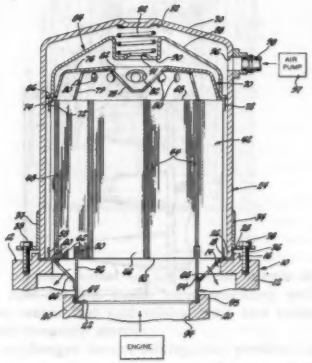
ENGINE EXHAUST SYSTEM WITH MONOLITHIC CATALYST ELEMENT

Michael R. Foster, Goodrich, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 12, 1974, Ser. No. 478,459

Int. Cl.² B01J *8/00*

U.S. Cl. 23—288 FB **1 Claim**



1. A catalytic converter adapted for use in an engine exhaust system with an exhaust conduit and a source of pressurized air, the catalytic converter comprising:

a generally cylindrical casing having central inlet means and peripheral outlet means at one axial end thereof, a catalyst element seat at the one end surrounding the inlet and outlet means and means at the other end adapted for admitting pressurized air source;

a cylindrical monolithic catalyst element having one axial end engaging the catalyst element seat, the catalyst element defining separate central and peripheral flow paths extending axially therethrough, the casing including conduit means engaging the one end of the catalyst element between the central and peripheral flow paths to communicate the inlet means with the central flow path for exhaust gas flow therethrough to the other end thereof and the outlet means with the peripheral flow path for exhaust gas flow therefrom to the outlet means; a flow-reversing baffle having a peripheral flange portion abutting the other end of the catalyst element, a central portion spaced from the other end of the catalyst element and an opening for the admission of air from the air admission means, the flow-reversing baffle being effective to receive exhaust gas from the other end of the central flow path and air from the air admission means and direct both into the other end of the peripheral flow path for

return flow to the outlet means; a generally cup-shaped member in the casing having a peripheral flange engaging the peripheral flange of the flow-reversing baffle, a central portion spaced therefrom toward the other end of the casing, a central opening for air flow therethrough and a spring seat surrounding the opening;

and a coil spring compressed between the spring seat and the other end of the casing, whereby the catalyst element is biased against the catalyst element seat and the spring is separated from contact with exhaust gases by the flow-reversing baffle and cup-shaped member and cooled by air flowing over it from the air admission means to the catalyst element.

3,957,446

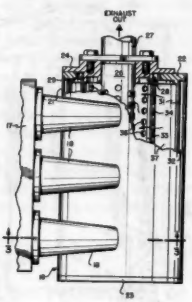
SWIRL REACTOR FOR EXHAUST GASES

Edward A. Mayer, Newburgh; Martin Alperstein, Fishkill; John T. Brandenburg, and Edward Mitchell, both of Hopewell Junction, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 244,165, April 14, 1972, abandoned. This application Aug. 12, 1974, Ser. No. 496,490

Int. Cl.[2] F23G *7/06;* **F01N** *3/15*

U.S. Cl. 23—288 F **5 Claims**



1. A reactor for treating hot exhaust gases which result from the combustion of a hydrocarbon fuel mixture within a combustion chamber, the latter having an exhaust port for discharging a hot exhaust gas stream, which reactor comprises;

means forming an elongated swirl passage having a guide wall extending longitudinally of said reactor,

inlet means opening into said means forming said swirl passage and being communicated with said exhaust port to direct a stream of hot exhaust gas tangentially aginst said swirl passage guide wall, whereby the latter will urge said exhaust gas stream into a rapidly swirling pattern within said swirl passage,

means forming an elongated reactor chamber communicating with said swirl passage, having an outer wall extending longitudinally of said swirl passage guide wall and being spaced inwardly from the latter to define an annulus therebetween, and discharge means in said reactor chamber for passing treated exhaust gas therefrom, said annulus formed between said guide wall and said reactor chamber outer wall respectively, being progressively narrowed from said inlet means, for a distance approximately one-half of the annulus to a point of maximum constriction adjacent to said guide wall, and extending longitudinally of said reactor chamber whereby to increase the velocity of gas flow in said gas swirl forming passage as said gas progresses through said swirl forming passage.

3,957,447

CATALYTIC CONVERTOR

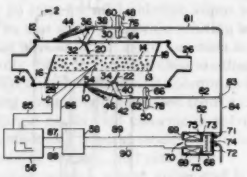
Masanori Hanaoka, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 5, 1974, Ser. No. 448,348

Claims priority, application Japan, Oct. 3, 1973, 48-110481

Int. Cl.[2] B01J *8/02;* **F01N** *3/15*

U.S. Cl. 23—288 F **3 Claims**



2. A catalytic converter for use in purifying exhaust gas from the internal combustion engine of an automobile comprising:

a casing having an inner wall, an exhaust gas inlet at one end of said casing and an exhaust gas outlet at the other end of said casing;

catalyst holder means disposed substantially central of said casing having top and bottom perforated walls spaced from the inner wall of said casing and side portions; two of said side portions being substantially parallel to and formed by said inner wall and two of said side portions being transverse to said inner wall of said casing;

a first shielding member consisting of a portion for forming one of said transverse side portions of said catalyst holder means and a portion for forming a support of said catalyst holder means;

a second shielding member consisting of a portion for forming the other of said transverse side portions of said catalyst holder means and a portion for forming a support of said catalyst holder means;

each of said support portions engaging a portion of the inner wall of said casing;

an inlet plenum in communication with said exhaust gas inlet defined by said shielding members, said inner wall of said casing and the top perforated wall of said catalyst holder means;

an outlet plenum in communication with said exhaust gas outlet defined by said shielding members, said inner wall of said casing and the bottom perforated wall of said catalyst holder means;

a first normally closed valve means disposed within said inlet plenum between said first and second shielding members;

a second normally closed valve means disposed within said outlet plenum in a position closer to said first shielding member than is said first valve means;

each of said valve means comprising an elongated vane member disposed transverse to said inner wall of said casing and dividing their respective plenums into two sections:

temperature sensing means located within said catalyst holder means; and

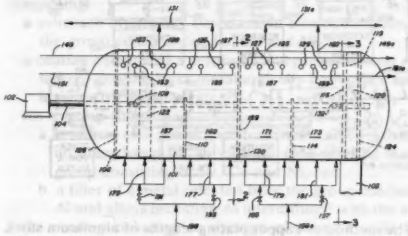
control means responsive to an increase in the temperature in said catalyst holder means to simultaneously open said first and second valve means;

whereby the closed position of said valve means defines with said shielding members a circuitous sequential path through said sections of said catalyst holder means of predetermined residence time and the simultaneous opening of said first and second valve means opens said sections and thereby decreases the residence time of said exhaust gas within said catalyst holder means as a function of the temperature of said catalyst.

3,957,448
DIVIDED HORIZONTAL REACTOR FOR THE VAPOR PHASE POLYMERIZATION OF MONOMERS AT DIFFERENT HYDROGEN LEVELS

John W. Shepard, Naperville; James L. Jezl, St. Charles; Edwin F. Peters, Winfield, and Robert D. Hall, Wheaton, all of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Dec. 16, 1974, Ser. No. 533,019
Int. Cl.² B01J 8/36, 8/38
U.S. Cl. 23—288 R 11 Claims



1. Apparatus for the vapor phase polymerization of at least one polymerizable monomer comprising:

a. a horizontal reactor of substantially circular cross-section containing a centrally-located drive shaft extending longitudinally through said reactor to which are attached a plurality of adjacently located paddles, which paddles cause essentially no forward or backward movement of the particulate matter contained in said reactor and extend transversely within and to a short distance from the internal surfaces of said reactor, said reactor being divided into two or more individually gas-composition-controllable and polymerization-temperature controllable polymerization compartments by one or more dividing structures so constructed to control gas intermixing and movement of said particulate between said compartments;

b. driving means for said drive shaft;

c. one or more reactor off-gas outlets in each of said compartments spaced along the topward part of said reactor;

d. one or more vapor recycle inlets in each of said compartments space along the bottomward part of said reactor;

e. one or more catalyst addition inlets spaced along said reactor;

f. a plurality of quench liquid inlets spaced along the topward part of said reactor whereby quench liquid can be introduced into said two or more compartments; and

g. take-off means for said particulate matter at one end of said reactor.

3,957,449
SYNTHESIS PLANT

Franciszek Ciechowski, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 335,112, Feb. 23, 1973, abandoned. This application Jan. 9, 1975, Ser. No. 539,740
Claims priority, application United Kingdom, Feb. 28, 1972, 9034/72
Int. Cl.² B01J 8/02; C01C 1/04; C07C 29/16
U.S. Cl. 23—289 4 Claims

1. A plant for catalytic exothermic gas phase conversion at superatmospheric temperature and pressure of synthesis gas to reacted gas producing a product recoverable in the liquid state and unreacted gas, which plant comprises:

an inner first vessel having closed top and side walls and a perforated bottom wall, said first vessel containing at least one bed of catalytic material,

an intermediate second vessel positioned concentrically around and spaced from said inner first vessel,

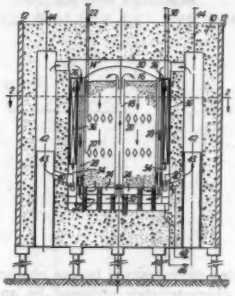
an axial conduit extending through said inner first and intermediate second vessels and extending above said catalytic material for directing synthesis gas to said bed of catalytic material,

heat exchanger means mounted adjacent said inner first and intermediate second vessels for transferring heat from reacted gas emerging from said bed of catalytic material to the synthesis gas,

cooling means mounted concentrically around said intermediate second vessel for condensing the product from said reacted gas,

separator means mounted adjacent said cooling means for separating condensed product and the unreacted gas,

an outer pressure vessel enclosing said inner first and intermediate second vessels, said heat exchanger means and said cooling means and being spaced therefrom so as to define a mixing zone said closed top of said inner first vessel,



said outer pressure vessel having conduit means located therein, said conduit means communicating with said separator means and said mixing zone and having gas circulators mounted therein,

said heat exchanger means having two portions, a first portion carrying the synthesis gas and a second portion carrying the reacted gas,

said first portion communicating at one end with said axial conduit and at the other end with said mixing zone,

said second portion communicating at one end with the perforated bottom of said inner first vessel and at the other end with said cooling means,

synthesis gas inlet means extending from the exterior of said outer pressure vessel into said conduit means for inserting fresh synthesis gas into the plant,

product withdrawal means for withdrawing said product from the plant extending from said separator means to the exterior of said outer pressure vessel.

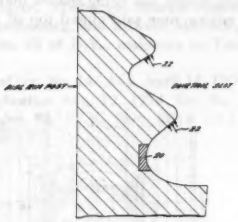
3,957,450
ARTICLE OF MANUFACTURE WITH PRE-DETERMINED FATIGUE LIFE

Trevor L. Salt, Beverly, Mass., assignor to General Electric Company, Lynn, Mass.

Division of Ser. No. 323,348, Jan. 15, 1973, Pat. No. 3,908,447. This application July 29, 1974, Ser. No. 492,859
Int. Cl.² B21K 3/04
U.S. Cl. 29—180 R 4 Claims

1. An article of manufacture intended to serve in an environment in which it is required to have a minimum useful fatigue life in a maximum stress portion wherein the article is manufactured by the process of:

selecting a material for construction of the article;
obtaining stress/strain data for the selected material;
obtaining stress intensity crack growth data for the selected material;
obtaining experimentally a characteristic material defect length (λ) for the selected material by:
a. obtaining at least one measured fatigue characteristic for the selected material;
b. selecting at random a first characteristic material defect length (λ) for the selected material; and then
c. applying λ to the stress/strain data and the stress intensity crack growth data to obtain fatigue characteristics and then



d. comparing the measured fatigue characteristics with the fatigue characteristics obtained by applying λ to the stress/strain and stress intensity crack growth data, and modifying the selected value for λ until these fatigue characteristics match;
making an initial design for the article;
applying λ to the stress/strain data and the stress intensity crack growth data to determine the useful fatigue life of the article in the maximum stress portion of the initial design; and
making the article to the design if the useful fatigue life is at least said minimum or reshaping the design of the maximum stress portion until the minimum useful fatigue life is attained and then making the article to the reshaped design.

3,957,451

RUTHENIUM POWDER METAL ALLOY

Gregory K. Rasmussen, Grand Blanc, and John Hrinevich, Jr., Flint, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 2, 1974, Ser. No. 493,872
Int. Cl.² B22F *3/00*; **C22C** *33/00*, *19/00*, *5/02*
U.S. Cl. 29—182 **5 Claims**

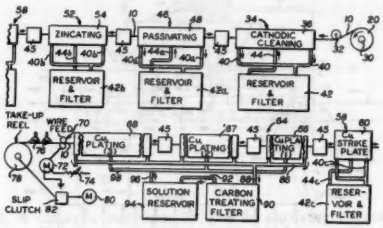
1. A sintered powder metal alloy containing, by weight, about 75 to 85% ruthenium dispersed in a matrix of about 15–25% of a pre-alloyed composition consisting essentially of, by weight, about 65–80% nickel, about 5–10% chromium, about 5–15% tungsten, about 4–6% silicon and about 2–6% iron, the surface of said ruthenium powder being soluble in said pre-alloyed composition for ductility and having good oxidation and spark erosion resistance at temperatures as high as about 2000° F., said ruthenium being present essentially in the form of grains dispersed in and metallurgically bonded at the surface to said nickel base alloy matrix.

3,957,452

PROCEDURE FOR COPPER PLATING ALUMINIUM WIRE AND PRODUCT THEREOF

Glenn R. Schaer, Columbus, and Richard W. Sexton, Hilliard, both of Ohio, assignors to General Cable Corporation, Greenwich, Conn.

Filed Dec. 12, 1974, Ser. No. 531,916
Int. Cl.² B23P *3/00*; **C25D** *5/10*, *5/30*, *7/06*
U.S. Cl. 29—183.5 **16 Claims**



1. The method of copper plating lengths of aluminum stock which comprises subjecting the aluminum stock to a zincate activation step, then electro-plating the stock with a strike plating of metal from the group consisting of copper, brass, and bronze in an alkaline bath and to a thickness between about 0.03 to 0.06 mils, and then electroplating the material with additional copper in an acid bath, the thickness of the additional copper plating being substantially greater than the strike plating.

15. The product of the process of claim 1.

3,957,453

SINTERED METAL POWDER ELECTRIC CONTACT MATERIAL

Heinrich Hässler, Wendelstein, and Hans-Joachim Lippmann, Boxdorf, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed July 23, 1973, Ser. No. 381,516
Claims priority, application Germany, Aug. 17, 1972, 2240493
Int. Cl.² B22F *3/00*
U.S. Cl. 29—182.1 **1 Claim**

1. An electric contact material comprising a sintered metal powder matrix formed by metal powder particles interconnected by interbonding portions and defining pores impregnated with an impregnant material of high electrical conductivity and selected from the class consisting of copper and silver and alloys of copper-silver, copper-bismuth, copper-silver-bismuth, silver-bismuth, copper-tellurium and copper-silver-tellurium; said particles at least mainly consisting essentially of a refractory metal selected from the class consisting of chromium, zirconium and titanium, and said interbonding portions consisting essentially of an alloy of said refractory metal and an alloying metal;

when said refractory metal is chromium said alloying metal being selected from the class consisting of zirconium, iron, nickel, cobalt, titanium and manganese; when said refractory metal is zirconium said alloying metal being selected from the class consisting of chromium, cobalt, iron, nickel, titanium and manganese; and when said refractory metal is titanium said alloying metal being selected from the class consisting of cobalt, iron, nickel and manganese; said alloying metal comprising by weight from 0.2 percent to not more than 15 percent of the total weight of said refractory metal particles and said alloy having a melting temperature higher than that of said impregnant material and being present at least mainly on the surfaces of said particles; said particles of said matrix being substantially free from effects of compression pressure of said matrix during sintering, and said pores being at least

mainly open pores and substantially completely impregnated with said impregnant material.

3,957,454

COATED ARTICLE

Irwin I. Bessen, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 353,764, April 23, 1973. This application Nov. 15, 1974, Ser. No. 524,328

Int. Cl.² B32B *15/00*

U.S. Cl. 29—194 4 Claims

1. A coated article of improved resistance to hot corrosion comprising:

a substrate of an alloy based on an element selected from the group consisting of Fe, Co and Ni; and

a coating comprising a deformed and predominately recrystallized coating layer metallurgically bonded by interdiffusion with the substrate,

the coating comprising:

a. a matrix of a plurality of fused and forged particles of an alloy based on an element (M) selected from the group consisting of Fe, Co and Ni, and

b. a filler of a metal selected from the group consisting of Al and alloys including Al interdiffused with the matrix,

the coating including an average of about 8 – 20 weight percent Al, with the balance elements of the alloy of M and elements of the substrate, and having a hardness of no more than about 500 Vickers DPH.

3,957,455

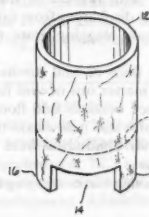
CHARCOAL IGNITING DEVICE

Roger S. Clark, Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Sept. 24, 1973, Ser. No. 400,103

Int. Cl.² C10L *11/08, 11/00*

U.S. Cl. 44—35 7 Claims



1. A portable charcoal lighter device having high thermal efficiency comprising a generally vertical hollow container open at the top and bottom and having generally vertical side walls, said side walls having a plurality of air intake openings in the lower portion thereof, with said container being a unitary body comprising a predominant amount of inorganic fiber and binder therewith.

3,957,456

PREPARATION OF A WET LOAD OF COAL FOR TRANSPORT AND STORAGE

Eke Verschuur, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 11, 1974, Ser. No. 513,968

Claims priority, application United Kingdom, Oct. 23, 1973, 49214/73

Int. Cl.² C10L *5/00, 9/00*

U.S. Cl. 44—10 E 29 Claims

1. A method for the preparation of a wet load of coal for storage and vessel transport, the coal having a bulk density of at least 700 kg/m³ and being prepared from an aqueous slurry of coal fines, the coal having less water than the slurry to facilitate storage and transportation and being resistant to settling and compacting of the fines in the coal to facilitate removal of the coal from storage and transportation means, comprising preparing briquettes with a dry appearance containing less that 20% by weight of water from the aqueous slurry of coal fines and subsequently mixing the briquettes with a mass of water and coal fines.

16. The method of claim 8 in which the binder used contains a light hydrocarbon oil fraction and high-boiling heavy hydrocarbon oil fraction, and in which the light fraction is stripped from the briquettes obtained therefrom.

3,957,457

GASIFYING COAL OR COKE AND DISCHARGING ASH AGGLOMERATES

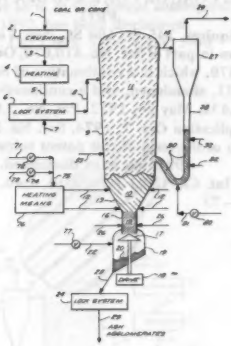
Arthur M. Squires, 245 W. 104 St., New York, N.Y. 10025

Continuation-in-part of Ser. No. 410,070, Oct. 26, 1973, Pat. No. 3,855,070, which is a continuation of Ser. No. 167,686, July 30, 1971, abandoned, and a continuation-in-part of Ser. No. 257,432, May 26, 1972, Pat. No. 3,840,353. This application Oct. 7, 1974, Ser. No. 512,841

The portion of the term of this patent subsequent to Oct. 8, 1991, has been disclaimed.

Int. Cl.² C10J *3/20, 3/42, 3/46, 3/54*

U.S. Cl. 48—73 7 Claims



1. Apparatus for gasifying granulated coal or coke prepared from coal, comprising:

a. a vessel housing contiguous upper and lower zones;

b. means for feeding to said vessel a granulated solid fuel selected from the group consisting of anthracites, subanthracites, bituminous coals, subbituminous coals, lignites, and cokes prepared from anthracites, subanthracites, bituminous coals, subbituminous coals, and lignites;

c. means for introducing a gasification medium into said lower zone wherein said medium is selected from the group of gas mixtures consisting of steam and oxygen, carbon dioxide and oxygen, steam and air enriched in oxygen, carbon dioxide and air enriched in oxygen, air, air and steam, air and carbon dioxide, and air and combustion products containing carbon dioxide and wherein the rate of said introduction is such as to establish in said lower zone a slow fluidized bed comprising particles of coke originating from said fuel intermingled with agglomerates of ash matter and wherein the temperature of said slow fluidized bed is between about 2,050°F and about 2,650°F and wherein the fluidizing-gas velocity in said bed is greater than about 4 feet per second;

d. means for substantially separating gas and solid particles and a connection of said means to the top of said upper zone;

e. pipe means for discharging said separated gas;
f. means for conducting said separated particles in a slow fluidized condition from said separating means (d) to substantially the bottom of said upper zone at a rate of flow of said separated particles into said upper zone sufficient to establish therein a fast fluidized bed of said separated particles together with fine particles of coke entering said upper zone from said slow fluidized bed in said lower zone;
g. a standpipe for conducting agglomerates of ash matter together with intermingled particles of coke away from the bottom of said lower zone wherein said standpipe terminates in a mechanical grate for discharging said conducted agglomerates and wherein said conducted agglomerates constitute a gravitating bed in said standpipe and wherein said gravitating bed rests upon said mechanical grate;
h. a space beneath said mechanical grate and receiving ash agglomerates therefrom;
i. means for supplying an oxidizing medium to said space to flow upward past said grate and into said gravitating bed at a rate sufficient to oxidize said intermingled particles of coke to gaseous products; and
j. means for discharging ash agglomerates from said space in (h).

3,957,458

GASIFYING COAL OR COKE AND DISCHARGING SLAG FRIT

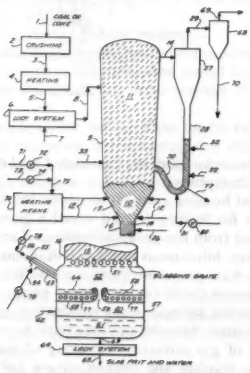
Arthur M. Squires, 245 W. 104 St., New York, N.Y. 10025

Continuation-in-part of Ser. No. 410,070, Oct. 26, 1973, Pat. No. 3,855,070, which is a continuation of Ser. No. 167,686, July 30, 1971, abandoned, and a continuation-in-part of Ser. No. 257,432, May 26, 1972, Pat. No. 3,840,353. This application Oct. 7, 1974, Ser. No. 512,867

The portion of the term of this patent subsequent to Oct. 8, 1991, has been disclaimed.

Int. Cl.[2] C10J *3/20, 3/36, 3/46, 3/54*

U.S. Cl. 48—73 **9 Claims**



1. Apparatus for gasifying granulated coal or coke prepared from coal, comprising:
a. a vessel housing contiguous upper and lower zones;
b. means for feeding to said vessel a granulated solid fuel selected from the group consisting of anthracites, subanthracites, bituminous coals, subbituminous coals, lignites, and cokes prepared from anthracites, subanthracites, bituminous coals, subbituminous coals, and lignites;
c. means for introducing a gasification medium into said lower zone wherein said medium is selected from the group of gas mixtures consisting of steam and oxygen, carbon dioxide and oxygen, steam and air enriched in oxygen, carbon dioxide and air enriched in oxygen, air, air and steam, air and carbon dioxide, and air and combustion products containing carbon dioxide and wherein the rate of said introduction is such as to establish in said lower zone a slow fluidized bed comprising particles of coke originating from said fuel intermingled with agglomerates of ash matter and wherein the temperature of said slow fluidized bed is between about 1,900°F and about 2,450°F and wherein the fluidizing-gas velocity in said bed is greater than about 4 feet per second;
d. means for substantially separating gas and solid particles and a connection of said means to the top of said upper zone;
e. pipe means for discharging said separated gas;
f. means for conducting said separated particles in a slow fluidized condition from said separating means (d) to substantially the bottom of said upper zone at a rate of flow of said separated particles into said upper zone sufficient to establish therein a fast fluidized bed of said separated particles together with fine particles of coke entering said upper zone from said slow fluidized bed in said lower zone;
g. a standpipe for conducting agglomerates of ash matter away from the bottom of said lower zone wherein said standpipe terminates in a water-cooled slagging grate for discharging said conducted agglomerates in molten form and wherein said conducted agglomerates constitute a gravitating bed in said standpipe and wherein said gravitating bed rests upon said slagging grate;
h. a forehearth beneath said slagging grate;
i. means for supplying fuel and oxidizing medium to said forehearth at a rate to maintain therein a slagging temperature and to supply hot combustion products to the bottom of said gravitating bed at a rate and temperature sufficient to melt said agglomerates to form molten ash matter and wherein said combustion products are oxidizing in character with respect to iron and wherein said molten ash matter discharges from said gravitating bed by dropping from said slagging grate to the floor of said forehearth;
j. a taphole in the floor of said forehearth for conducting said molten ash matter out of said forehearth;
k. an enclosed space beneath said floor of said forehearth housing a pool of water below said taphole to catch said molten ash matter conducted from said forehearth via said taphole; and
l. means for conducting water and slag frit from said pool of water.

3,957,459

COAL GASIFICATION ASH REMOVAL SYSTEM

Willard N. Mitchell; Edward L. Wilson, and Hermann E. Von Rosenberg, all of Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

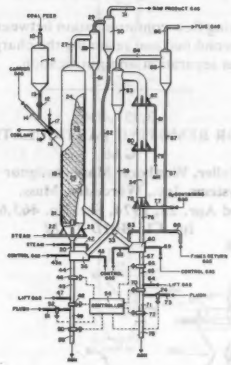
Filed Apr. 4, 1974, Ser. No. 457,958

Int. Cl.[2] C10J *3/54;* **B07B** *4/00*

U.S. Cl. 48—197 R **10 Claims**

8. In a process wherein carbonaceous solids including ash-forming constituents are withdrawn from a first vessel having a substantially vertical bottom inlet line, introduced into a second vessel having a substantially vertical bottom inlet line through said bottom inlet line in said second vessel, withdrawn from said second vessel, and returned to said first vessel through said bottom inlet line in said first vessel and wherein carbon contained in said solids is partially consumed in at least one of said vessels and ash tends to accumulate in the system, the improvement which comprises introducing a dense phase stream of said carbonaceous solids withdrawn from said second vessel into said bottom inlet line of said first vessel in a substantially horizontal direction, introducing a stream of carrier gas into said bottom inlet line of said first vessel at a

point below that at which said dense phase stream of solids is introduced into said inlet line of said first vessel, passing said stream of carrier gas upwardly in said inlet line of said first vessel at a velocity sufficient to entrain particles from said dense phase stream having an ash content less than about 65 weight percent but insufficient to entrain particles from said dense phase stream having an ash content greater than about 85 weight percent; passing said stream of carrier gas and solid

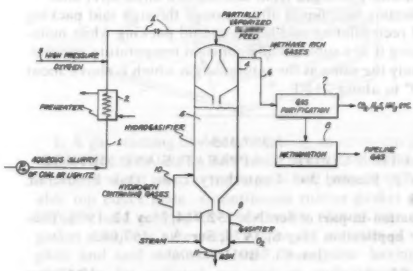


particles entrained therein from said bottom inlet line of said first vessel into said first vessel; introducing additional gaseous fluid into said first vessel near the lower end thereof independently of said bottom inlet line therein to maintain the carbonaceous solids contained within said first vessel in a fluidized state; collecting solid particles which are not entrained in said stream of carrier gas in said bottom inlet line of said first vessel; and withdrawing the collected particles from the system.

3,957,460
OXIDATION OF COAL-WATER SLURRY FEED TO HYDROGASIFIER

Bernard S. Lee, Lincolnwood, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 9, 1975, Ser. No. 611,780
Int. Cl.² C10J 1/16; C01B 2/14
U.S. Cl. 48—197 R **7 Claims**



1. A process for feeding carbonaceous solids to a hydrogasification reactor in which hot, methane-containing effluent gases are produced, comprising: forming an aqueous slurry of said carbonaceous solids, preheating said slurry under a pressure of at least about 300 pounds per square inch to a temperature in the range of about 400° to 700°F., introducing high pressure oxygen into said preheated slurry to partially oxidize said carbonaceous solids and thereby further heat and partially vaporize said slurry, introducing said partially vaporized slurry into direct contact with said hot, methane-containing effluent gases so as to completely evaporate the remaining unvaporized water portion of the slurry, withdrawing the combined gases and vapors from said reactor and introducing the solids from the completely vaporized slurry into a hydrogenation zone of the hydrogasification reactor, the amount of oxygen introduced into said slurry being controlled to oxidize sufficient carbonaceous material of the slurry to make up the heat requirement for total evaporation of the water in the slurry in contact with the hot methane-rich effluent gases.

3,957,461
METHOD FOR PREPARING DIAMONDS FOR USE WITH GRINDING WHEELS

Olle Lindstrom, Taby, and Erik Lundblad, Robertsfors, both of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Continuation of Ser. No. 13,504, Feb. 24, 1970, abandoned, which is a continuation-in-part of Ser. No. 538,335, March 29, 1966, Pat. No. 3,904,391, which is a continuation-in-part of Ser. No. 479,810, Oct. 19, 1965, abandoned. This application Nov. 23, 1971, Ser. No. 201,491
The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.
Int. Cl.² C09K 3/14; C23C 5/00
U.S. Cl. 51—295 **6 Claims**

1. In a method for producing a grinding element having an effective grinding section including a body of cured resin material suitable for use as the bonding medium in a grinding element and diamond particles individually embedded in said cured resin, the improvement comprising the step of forming on the surface of discrete diamond particles a substantially continuous metal coating on and encapsulating said particles having a thickness of between 0.5 and 25 microns to be embedded in the resin material, said coating conforming substantially to the surface configuration of respective ones of said discrete particles, wherein said particles are bonded to said resin through said coating, wherein said diamond particles are of a size and form suitable for use as the abrasive particles in an effective grinding section and have a particle size smaller than 420 microns, wherein the thickness of said metal coating within the stated range is of a magnitude to impart to said body a grinding ratio which exceeds that of a given bare diamond grinding element, wherein said given bare diamond grinding element is identical to said body in every respect except the metal coating material is replaced by said cured resin, and wherein said metal coating is composed of metallic material suitable for forming and maintaining under ambient working conditions a mechanically strong shell for holding together fractional portions of the diamond particles, and effective to increase the adhesion between the diamond particles and said resin materials, and to dissipate heat from said diamond particles.

3,957,462

IONIZING ELECTRODE COATED WITH PLASTICS MATERIAL

Heinz Schminke, Egelsbach, and Willi Bätza, Offenbach, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 5, 1975, Ser. No. 583,902

Claims priority, application Germany, June 7, 1974, 2427509

Int. Cl.² B03C *3/41*

U.S. Cl. 55—2 **7 Claims**

1. An ionizing electrode for the generation of a corona discharge in an electrostatic dust-collecting precipitator, comprising an elongated metallic body provided with spaced-apart pointed tips, and a layer of nylon-11 material covering said body and having a thickness of 100 to 300 microns.

3,957,463

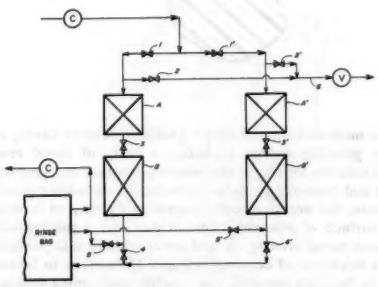
OXYGEN ENRICHMENT PROCESS

Gerald M. Drissel, and Shivaji Sircar, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 12, 1973, Ser. No. 423,995

Int. Cl.² B01D *53/02*

U.S. Cl. 55—25 **7 Claims**



1. In a method for regenerating adsorbents reduced in sorbent capacity during use in an oxygen enrichment vacuum swing gas separation and purification system utilizing a first bed of absorbent effective in adsorption of carbon dioxide and water and a second bed of adsorbent selective in retention of nitrogen as opposed to oxygen, said system operating on a cycle including a sorbtive gas separation and purification period and a regeneration period during which charge gas flow is discontinued, the improvement in regeneration which comprises,

a. applying a vacuum to the inlet end of said first bed while maintaining flow communication between said first bed and said second bed,

b. continuing application of said vacuum to said beds and attaining a reduced intermediate pressure of less than 60 mm. Hg, thereby desorbing gases from said beds including substantially all of the nitrogen from said second bed,

c. discontinuing flow communication between said second and said first beds while continuing vacuum application to said first bed to a lower terminal pressure at least 10mm. Hg below said intermediate pressure thereby desorbing any residual moisture and carbon dioxide from said first bed,

d. repressuring said second bed with product gas to about sorption cycle pressure during said continuing vacuum application to said first bed,

e. discontinuing vacuum application to said first bed and repressuring said first bed to about sorptive cycle pressure,

f. re-establishing flow communication between said first bed and said second bed and resuming the charge gas flow for sorbtive gas separation and purification.

3,957,464

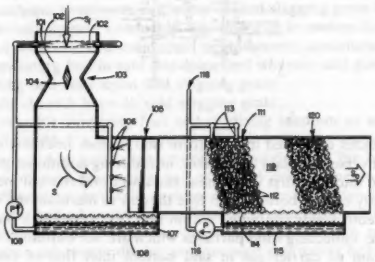
PROCESS FOR REMOVING PARTICULATES FROM A GAS

Aaron Joseph Teller, Westboro, Mass., assignor to Teller Environmental Systems, Inc., Worcester, Mass.

Filed Apr. 25, 1974, Ser. No. 463,652

Int. Cl.² B01D *47/12*

U.S. Cl. 55—68 **16 Claims**



1. A process for treating an effluent gas containing entrained particulates a portion of which are below 1 micron in size and acid gas components, said gas having a temperature above 150°F., which comprises:

a. initiating nucleation of the particulates in a first enclosure by treating the gas to increase its turbulence and to increase its humidity substantially to saturation at a temperature above about 150° to about 212°F. under substantially adiabatic conditions;

b. passing said saturated gas which is at a temperature above about 150° to about 212°F. in a substantially horizontal path through a second enclosure containing packing;

c. passing an aqueous scrubbing liquid downwardly over said packing;

d. exhausting said gas from said second enclosure; and,

e. collecting said liquid after passage through said packing and recirculating said liquid to said packing while maintaining it at a substantially constant temperature approximately the same as the saturated gas which is above about 150° to about 212°F

3,957,465

POLLUTION CONTROL APPARATUS AND METHOD

Ladislav J. Pircon, 305 Canterbury Lane, Oak Brook, Ill. 60521

Continuation-in-part of Ser. No. 252,914, May 12, 1972. This application May 6, 1974, Ser. No. 467,083

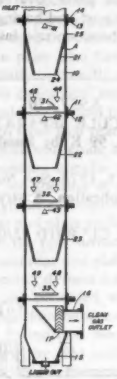
Int. Cl.² B01D *47/06*

U.S. Cl. 55—90 **19 Claims**

12. A process for removing pollutants from gas streams comprising:

passing the pollutant containing gas stream into the upper portion of a vertical casing;

passing the pollutant containing gas stream through a nozzle within the casing and having an entry in communication with the polluted gas inlet, the entry having an effective cross-sectional area of about 2 to about 12 times the effective cross-sectional area of the outlet and the mean angle of convergence of the nozzle being about 8° to about 18°, the acceleration and deceleration of the gas stream causing particulates to agglomerate in passing through the nozzle;



impinging the agglomerates upon an impingement plate beneath the nozzle outlet;

passing the gas stream around the periphery of said impingement plate to a lower portion of said casing;

removing the liquid and particulate matter from the lower portion of the casing; and

separately removing the clarified gas from the lower portion of the casing.

3,957,466

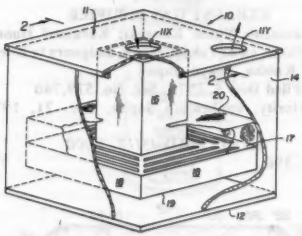
GAS WASHING DEVICE

John J. Coppola, 1054 59th St., Brooklyn, N.Y. 11219

Filed Mar. 8, 1974, Ser. No. 449,440

Int. Cl.² B01D *47/02*

U.S. Cl. 55—256 **1 Claim**



1. A gas washing device comprising an open top gas impervious container having side walls and a conical bottom wall with a cleanout valve at the apex of said bottom wall, a removable top cover plate, a continuous rubber gasket positioned between said cover plate and the top of said side walls, said gasket providing a hermetic seal at the junction of said cover plate and said side walls, said cover plate having an inlet aperature for polluted gas and an outlet aperature for a cleaned gas, tubular means depending downwardly from and hermetically sealed to said cover plate around said inlet aperature, bell chamber means hermetically secured to the bottom edge of said tubular means, said bell chamber means having a horizontally disposed top slotted plated connected to said tubular means, imperforate side walls connected to and depending downwardly from said top slotted plate, wire mesh means disposed upon and over said top slotted plate and surrounding and connected to said tubular means, the aperatures of said wire mesh means being smaller than the slots of said top slotted plate, said wire mesh means extending radially outwardly from said tubular means the same distance as said top slotted plate, said bell chamber means and said wire mesh means being spaced from the side walls of said container, an aqueous detergent solution disposed in said container, the level of said solution being above the weir mesh means so that the wire mesh means and the bell chamber means are submerged in said solution, whereby when polluted gases are passed into said inlet aperature they pass downwardly through said tubular means and diffuse outwardly into said solution in said bell chamber means, they then pass upwardly through said top slotted plate, said wire mesh means and out said outlet aperature.

3,957,467

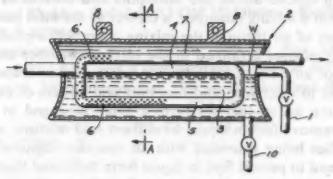
VEHICULAR POLLUTION CONTROL MUFFLER

Seun Kyung Kim, 7226 N. Bell Ave., Chicago, Ill. 60645

Filed Nov. 19, 1974, Ser. No. 525,105

Int. Cl.² B01D *47/02*

U.S. Cl. 55—256 **2 Claims**



1. A muffler for exhaust gases from an internal combustion engine comprising:

an elongated tubular housing member having enclosing end walls;

a liquid gas-purifying agent contained in said housing;

an over-flow conduct extending through one of said end walls;

valve means in said over-flow conduct to maintain said agent at a predetermined liquid level within and longitudenally of said housing;

an exhaust gas conduct extending through said housng from an inlet end to an outlet end;

said exhaust gas conduct having inter-connected continous portions including an inlet portion that extends on an axis substantially coincidental with said liquid level, an intermediate portion extending below said liquid level and back toward said other end wall, a substantially vertical riser portion spaced from said other end wall and an exhaust portion extending from said riser portion above said liquid level to said outlet end through one end wall and;

a plurality of perforations in a section of said intermediate portion nearest said other end wall in said riser portion below said liquid level and a plurality of perforations in a section of said exhaust portion nearest said other end wall above said liquid level;

whereby, the exhaust gases entering said inlet portion are conducted into said intermediate portions of said conduct and are dispersed through said perforations below said liquid level into said liquid gas-purifying agent for purification thereby and the purified exhaust gases accumulate within said housing above said liquid level for passage through said perforations in said section of said exhaust portion and thence into said outlet of said conduct.

3,957,468

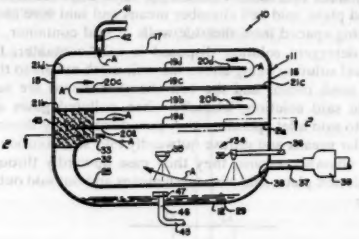
CARBURETOR

John J. Voth, and Jacob E. Voth, both of P.O. Box 157, Lac La Hache, British Columbia, Canada

Filed Oct. 28, 1963, Ser. No. 319,104

Int. Cl.² B01D 47/00

U.S. Cl. 55—259 2 Claims



1. A carburetor comprising a vertically elongated casing having an inlet port adjacent but spaced above its lower end and having an outlet port spaced above said inlet port, a series of horizontally elongated vertically spaced baffles in the casing arranged so that adjacent baffles are connected at opposite ends to opposite walls of the casing to form a tortuous passage between the inlet port and outlet port, the lowermost of said baffles being spaced above the inlet port and bottom of the casing to form a mixing chamber, a blower at the inlet port to pass a stream of air through the mixing chamber, a plurality of atomizing nozzles arranged in the mixing chamber above the stream of air being adapted when connected to a source of liquid fuel to discharge said fuel into said stream of air so as to produce an air-fuel mixture, a filter arranged in the passage to remove fuel in liquid form from said mixture, each of said baffles being provided with an aperture adjacent its connected end to permit fuel in liquid form collected thereon to pass therethrough and return to the mixing chamber, a sump arranged below the mixing chamber to receive said liquid fuel, and valve means automatically openable when the liquid fuel in the sump has reached a predetermined level to permit draining of said fuel therefrom.

3,957,469

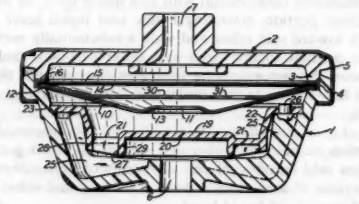
FILTER CASSETTE WITH REMOVABLE CAPSULE

Stanley P. Nebash, Pittsburgh, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Feb. 3, 1975, Ser. No. 546,439

Int. Cl.² B01D 53/30

U.S. Cl. 55—270 10 Claims



1. A filter unit comprising a shallow cup having a central inlet opening in its base and an annular shoulder at its open end, a filter disc in the cup having a marginal area overlying said shoulder, a barrier member disposed inside the cup between its base and the filter disc and having a central portion spaced from the disc and inlet opening, said central portion having a solid central area with a diameter at least as great as said inlet opening and coaxial with it, said central portion being provided with holes around said solid central area for passage of air, means securing the marginal areas of the disc and barrier in place so that a hollow capsule is formed that is separated into two chambers by the barrier, and a separable two-part cassette removably containing the capsule with said shoulder and marginal areas of the disc and barrier clamped between said parts, one of said cassette parts containing said cup and having an end wall provided with an inlet port, and the other of the cassette parts covering said filter disc and provided with an outlet port and having an end wall forming one wall of a chamber between said last-mentioned end wall and the capsule.

3,957,470

MOLECULE SEPARATORS

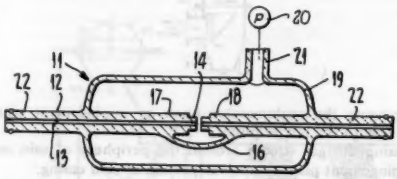
Ernest Fredrick Dawes, 99 Kilby Road, East Kew, Victoria, Australia

Filed Oct. 15, 1974, Ser. No. 514,810

Claims priority, application Australia, Oct. 18, 1973, 5291/73

Int. Cl.² B01D 45/00

U.S. Cl. 55—342 10 Claims



1. A molecule separator comprising an evacuation chamber, an evacuation means, means on the chamber for connecting said evacuating means to said chamber, a tube extending through the chamber and sealed to the chamber walls, said tube having a transverse cut at least part way therethrough to form two axially aligned nozzles in the chamber, the transverse cut passing through the bore of the tube, and rigid connecting means interconnecting the portions of tubing on both sides of the transverse cut.

3,957,471

EXHAUST GAS PURIFIER

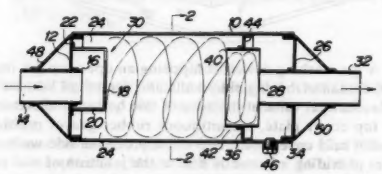
Yoshihiro Tamachi; Yukio Kanzaki; Kazunori Hondo, and Shigeru Uchida, all of Tokyo, Japan, assignors to Hoei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 5, 1974, Ser. No. 529,780

Claims priority, application Japan, Dec. 21, 1973, 48-145738[U]

Int. Cl.² B01D 45/12, 50/00

U.S. Cl. 55—396 7 Claims



1. An exhaust gas purifier comprising a cylindrical member, a front end plate closing one longitudinal end of said cylindrical member, a rear end plate closing the other longitudinal end of said cylindrical member, an exhaust gas inlet conduit

passing through an opening in said front end plate and extending into said cylindrical member a predetermined distance beyond said front plate, said inlet conduit having an inlet portion and an outlet portion, a swirl-generating means disposed in said cylindrical member surrounding said outlet portion of said inlet conduit such that a primary annular chamber is formed between the outside surfaces of said swirl-generating means, the inside surface of said cylindrical member, and the inside surface of said front end plate, a partition plate disposed in said cylindrical member for dividing the latter into two parts, said partition plate having a central hole with a diameter larger than the outside diameter of said outlet conduit, said partition plate also having a through-hole at a position disposed radially outwardly of said central hole and radially inward of said cylindrical member, and a guide tube disposed in said central hole of said partition plate, said partition plate being spaced from said rear end plate, whereby said partition plate along with said guide tube, and said cylindrical member define a secondary annular chamber, an outlet conduit passing through an opening in said rear end plate and extending into said cylindrical member a predetermined distance beyond said rear end plate such that the outside surface of said outlet conduit, the rear surface of said partition plate, the inside surface of said rear end plate, and the inside surface of said cylindrical member defines a dust chamber, said swirl-generating means being provided with a plurality of swirl vanes having passages therebetween, whereby exhaust gas introduced into said cylindrical member through said inlet conduit is made to swirl by said swirl-generating means into said primary annular chamber thereby extending the length of time the exhaust gas is in said cylindrical member and centrifugally separating solid particles in the exhaust gas including sparks and discharging relatively clean gas in a central flow portion of the exhaust gas through said outlet conduit as said solid particles pass to said dust chamber.

3,957,472

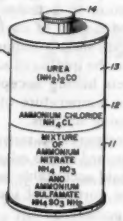
CHEMICAL HEAT TRANSFER UNIT

William R. Donnelly, Piqua, Ohio, assignor to Readi Temp Inc., Piqua, Ohio

Continuation of Ser. No. 334,434, Feb. 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 86,069, Nov. 2, 1970, abandoned. This application June 10, 1975, Ser. No. 585,502

Int. Cl.² F25D *5/00*

U.S. Cl. 62—4 **14 Claims**



1. A heat transfer unit including a container, two chemical materials in said container in a particulate, dry inactive state, said materials being commonly adapted to be energized by the application of a liquid activating agent to produce heat transfer, and each said material characterized by the physical property of being destructive of the capacity of the other to provide heat transfer if there is contact therebetween in a dry state, a third material in said container, said third material being a dry particulate chemical material which is interposed to normally separate said heat transfer materials, said separating material being of a character which will not react with the adjacent heat transfer materials in a dry state, and said third chemical material having the characteristic of dissolving on addition of said activating agent to provide for communication of and a reinforcing interaction of said heat transfer materials in their energized liquid state, one of said heat transfer materials being chosen from the group consisting of: (1) ammonium nitrate in admixture with a compound chosen from the group consisting of ammonium sulfamate, potassium nitrate, ammonium bisulfate, ammonium bromide, ammonium bicarbonate, ammonium iodide, ammonium magnesium selenate, ammonium manganese sulfate, ammonium phosphate dibasic, ammonium potassium tartrate, ammonium salicylate, ammonium sulfate, ammonium sodium sulfate, ammonium thiocyanate, ammonium persulfate, potassium phosphate, potassium sulfate, potassium sodium tartrate, potassium thiocyanate, potassium iodide, and potassium chloride; and (2) a mixture of calcium oxide, sodium carbonate, and aluminum chloride; the other of said heat transfer materials being chosen from the group consisting of: (1) urea, urea in admixture with a compound chosen from the group consisting of afenil, sodium acetate, sodium citrate, sodium nitrate, sodium thiocyanate, sodium thiosulfate, citric acid, tartaric acid, ferric ammonium sulfate, and thiourea; and (2) calcium chloride; said group (1) of said one heat transfer material being used with said group (1) of said other heat transfer material, and said group (2) of said one heat transfer material being used with said group (2) of said other heat transfer material.

3,957,473

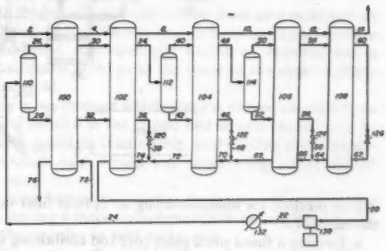
MIXED REFRIGERANT CYCLE

Thomas M. Stark, 22 Lynfield Drive, Morristown, N.J. 07960, and Sheldon Bodnick, 33 Old Middletown Road, Rockaway, N.J. 07866

Continuation-in-part of Ser. No. 309,341, Nov. 24, 1972, Pat. No. 3,884,045, and a continuation-in-part of Ser. No. 9,500, Feb. 9, 1970, abandoned. This application Sept. 9, 1974, Ser. No. 504,105

Int. Cl.² F25J *3/02*

U.S. Cl. 62—9 **2 Claims**



1. A method of cooling and liquefying natural gas in a first stage by a first multicomponent refrigerant and thereafter further cooling and liquefying said natural gas in a second stage by a second multicomponent refrigerant, the heat removed by said refrigerants in said first and second stages being discharged by compressing and condensing said refrigerants by indirect heat exchange against environmental cooling streams comprising the steps of:

a. precooling said natural gas to essentially ambient temperature by indirect heat exchange against at least one of said group of environmental cooling streams consisting of air and water and thereafter;

b. separating the combined first and second refrigerants into a vapor stream and a liquid stream;

c. cooling below ambient temperature in said first stage said natural gas and the vapor and liquid streams of (*b*) by indirect countercurrent heat exchange against said first refrigerant which exits said first stage after being warmed therein to near ambient temperature;

d. expanding to lower pressure and returning all of said liquid stream of (*b*) after cooling in step (*c*) directly to said first stage as said first refrigerant;

e. further cooling and liquefying said natural gas and the second refrigerant consisting of the vapor stream of (*b*) in said second stage by indirect countercurrent heat exchange against said second refrigerant which thereafter exits said second stage after absorbing heat therein at a temperature below that of said natural gas entering said second stage and without significant intervening temperature change is compressed and combined with the warmed first refrigerant from said first stage and thereafter the combined refrigerants are further compressed and cooled to near ambient temperature by indirect heat exchange against at least one of said group of environmental streams consisting of air and water, said combined refrigerants thereafter being separated into vapor and liquid phases in step (*b*), thereby completing the refrigeration cycle.

3,957,474

METHOD FOR MANUFACTURING AN OPTICAL FIBRE

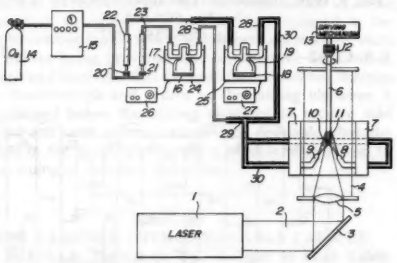
Soichi Kobayashi, Mito, and Tatsuo Izawa, Musashino, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Apr. 17, 1975, Ser. No. 569,113

Claims priority, application Japan, Apr. 24, 1974, 49-45471; Apr. 30, 1974, 49-48586

Int. Cl.² C03C *25/02*, *13/00*

U.S. Cl. 65—3 A **14 Claims**



1. A method for manufacturing an optical fiber comprising the steps of,

a. forming a fused silica glass core rod containing dopant by heating a rotatable and movable refractory mandrel by means of an irradiation of a carbon dioxide gas laser beam at a high temperature and by ejecting a mixed gas of oxygen and oxidizable silicon compound vapor and vapor of an oxidizable compound forming dopant to the refractory mandrel while rotating and moving said refractory mandrel so as to deposit silicon oxide and an oxide of said dopant thereon and by fusing the deposited oxides,

b. forming a fused silica glass cladding layer on said glass core rod by heating the surface of the glass core rod by means of an irradiation of a carbon dioxide gas laser beam at a high temperature and by ejecting a mixed gas of oxygen and oxidizable silicon compound to the surface of said glass core rod while rotating and moving the glass core rod so as to deposit silicon oxide on the surface of the glass core rod and by fusing the deposited silicon oxide, and

c. forming the optical fiber by heating a preform consisting of said glass core rod and said glass cladding layer at a temperature above the softening point of said preform and by spinning the heated preform.

3,957,475

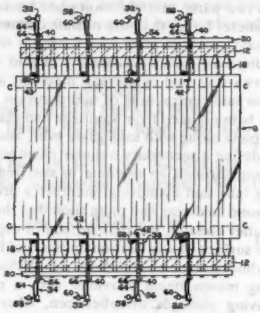
MEASURING GLASS SURFACE TEMPERATURE DURING ANNEALING

Ernest N. Schwenninger, Cumberland, Md., and Wright M. Welton, Jr., Paw Paw, W. Va., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 7, 1975, Ser. No. 565,328

Int. Cl.² C03B *25/04*

U.S. Cl. 65—29 **7 Claims**



1. Apparatus for determining the temperature, at a given station within a glass annealing lehr, of a moving glass ribbon along a line a given distance from an edge of said ribbon comprising a temperature sensitive element.

tube means for supporting said temperature sensing element in heat conducting relation to said ribbon at said station and comprising an inner end within said lehr and an outer end outside said lehr,

glass edge engaging means connected to said tube means within said lehr and constructed and arranged to enable said tube means to be in slidable relation to a surface of said ribbon said given distance from said edge when said glass edge engaging means engages said edge, and

means urging said glass edge engaging means into yielding engagement with said edge of said ribbon.

6. A method of treating a continuous glass ribbon having a main portion of acceptable optical quality flanked by edge portions of unacceptable optical quality comprising passing said ribbon past a series of temperature sensing stations in heat conducting relation to a temperature sensing element disposed adjacent and inward of each longitudinal side edge of the ribbon to provide sliding contact with one or the other edge portions wherein the quality of said ribbon is insufficient to provide glass sheets having acceptable optical properties and to determine the temperature of said ribbon at each of said temperature sensing stations,

maintaining said temperature sensing element a fixed distance laterally inward of the edge of the ribbon less than the distance to said acceptable main portion, and cutting said ribbon edge portions of insufficient optical quality from said main portion.

3,957,476

METHOD OF DIFFUSING IONS INTO QUARTZ GLASS

Karlheinz Rau, Hanau am Main, Germany, assignor to Heraeus-Schott Quarzschmelze GmbH, Hanau am Main, Germany

Division of Ser. No. 166,842, July 28, 1971, Pat. No. 3,772,154. This application June 14, 1973, Ser. No. 370,075

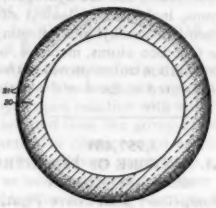
Claims priority, application Germany, Aug. 4, 1970, 2038564

Int. Cl.² C03C *21/00*

U.S. Cl. 65—30 R **3 Claims**

1. Process for preparing a quartz glass cylinder capable of forming an outer layer of uniformly fine crystalline silica when

heated to a temperature at which such crystalline silica forms which comprises applying to the outer surface of a quartz glass cylinder a coating consisting essentially of a solution or suspension of a compound containing crystallization promoting nuclei having a rate of diffusion in quartz glass less than that of sodium at elevated temperatures, said nuclei being selected



from the group of an element from Group IV of the periodic table, and boron, aluminum, phosphorus, antimony, zinc, magnesium, calcium, gallium, and mixtures thereof, then decomposing said compound and diffusing said nuclei into the outer surface of said cylinder by heating the coated cylinder at temperatures above the fusion temperature of silica without causing recrystallization of said quartz glass cylinder.

3,957,477

CONTROL SYSTEMS FOR CYCLIC PROCESSES

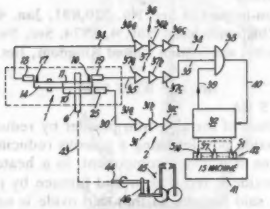
Stanley Peter Jones, Doncaster, and Peter Gerald Harrison, St. Albans, both of England, assignors to Emhart (U.K.) Limited, Doncaster, England

Filed Mar. 6, 1974, Ser. No. 448,785

Claims priority, application United Kingdom, Mar. 13, 1973, 11897/73

Int. Cl.² C03B *5/38, 5/30;* **C05B** *5/00;* **G05B** *7/00*

U.S. Cl. 65—158 **8 Claims**



1. Apparatus for performing a cyclic process, comprising handling apparatus for performing the steps of the process, a feeder mechanism including an operating shaft for feeding material or articles to be processed to the handling apparatus, a counter for controlling the performance by the handling apparatus, in timed relation, of the steps which comprise a process cycle, a rotatable generator shaft, means operatively connecting the generator shaft and the operating shaft of the feeder mechanism so that, during operation of the apparatus, the shafts are rotated at rates proportional to one another, means controlled by the generator shaft for generating a continuous train of pulses upon rotation of the generator shaft, means for feeding the continuous train of pulses to the counter to drive the counter, and resetting means for resetting the counter to initiate the performance of a process cycle by the handling apparatus, said resetting means comprising a first rotor operably connected to and rotatable under control of the generator shaft in synchronism with the continuous pulses in the pulse train, means disposed on the first rotor for generating a first rotor pulse during each rotation of the first rotor, a second rotor, means drivingly connecting the second rotor to the first rotor for rotation therewith at a speed different from the speed of rotation of the first rotor, means disposed on the second rotor for generating a second rotor pulse during each rotation of the second rotor, and means responsive to a coincidence between first rotor and second rotor pulses produced during the rotations of the first and second rotors for applying a resetting pulse to reset the counter.

3,957,478

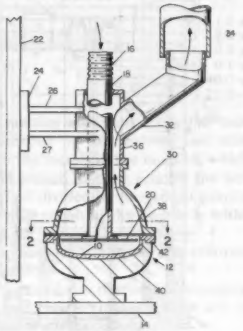
COOLING PRESSED GLASS ARTICLES

Mario Cuniberti, Columbus, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 27, 1975, Ser. No. 544,035

Int. Cl.² C03B *11/00*

U.S. Cl. 65—181 **6 Claims**



5. An apparatus for cooling a glass part, contained within an open-top mold, with a high volume flow of gas which comprises, in combination:

a shroud having a closed end remote from said mold and an open end adjacent to but spaced from the upper surface of said mold, said open end having an opening that is complemental in shape to the shape of the upper surface of said mold;

a cooling tube, through which said gas passes, secured in an opening formed in the closed end of said shroud in substantially gas-tight relationship, said cooling tube extending through said shroud and terminating adjacent said glass part;

a baffle, attached to the lower end of said cooling tube, said baffle having a shape complemental to but slightly smaller than the opening in said mold; and

means for venting all gas introduced through said cooling tube into said shroud to a location remote from said mold.

3,957,479

GLASS TREATING FURNACE

Harold A. McMaster, 707 Riverside Drive, Woodville, Ohio 43469, and Norman C. Nitschke, 9102 Buck Road, Perrysburg, Ohio 43551

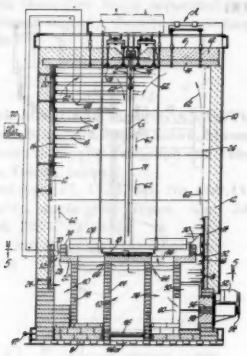
Division of Ser. No. 435,130, Jan. 21, 1974, Pat. No. 3,907,132, and a continuation-in-part of Ser. No. 365,939, June 1, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 542,152

Int. Cl.² C03B *29/04*

U.S. Cl. 65—350 **33 Claims**

1. A furnace for heat treating glass sheet material and the like comprising: a furnace enclosure having top, bottom and side walls of refractory material; a partition dividing the interior of said furnace enclosure into first and second zones; heating means in both of said zones; and gas treating and distributing means in said first zone; said gas treating and distributing means including an intake chamber communicat-

ing with a low temperature area of said second zone and with ambient atmosphere, a discharge chamber communicating with an area of said second zone spaced from said low temperature area with which said intake chamber communicates, at least a portion of the heating means in said first zone being located in said discharge chamber, and at least one blower having its intake side connected with said intake chamber and its discharge side connected with said discharge chamber; said gas treating and distributing means being operable to (1) draw gas from a low temperature area of said second zone into said first zone, (2) draw ambient gas from the exterior of said enclosure into said first zone, (3) mix the exterior gas and gas from said second zone to provide a substantially homogeneous temperature throughout the mixed gases, (4) heat the homogeneous mixture of gases, and (5) force the heated, homogeneous mixture of gases into said second zone.



16. A furnace for heat treating glass sheet material and the like comprising: a furnace enclosure having top, bottom and side walls of refractory material; an inlet and outlet in the side walls and a slot in the top wall; a material carrier movable through said inlet, said slot and said outlet for carrying material to be treated through said furnace; a housing overlying said slot and defining a pressure chamber in communication with said slot, and further including means for supplying fluid pressure to said housing to provide a fluid pressure barrier at said slot to resist escape of gases from said furnace through said slot, the pressure of the gases in said chamber also providing a resistance to the flow of fluid pressure from said housing into said furnace through said slot.

3,957,480

ALKYL AND HALOALKYLPYRAZOLES, COMPOSITIONS AND PROCESS

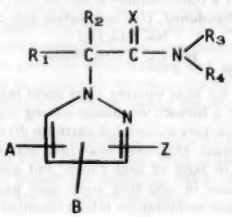
Gabriel Kornis, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 23, 1974, Ser. No. 535,360

Int. Cl.[2] C07D *233/10, 207/10, 211/16;* **A01N** *9/22*

U.S. Cl. 71—92 **87 Claims**

1. A compound of the formula:



wherein R_1 and R_2 are the same or different and are hydrogen, alkyl of from 1 to 6 carbon atoms, inclusive, or phenyl; R_3 is hydrogen, alkyl of from 1 to 8 carbon atoms, inclusive, phenyl, or benzyl; R_4 is hydrogen or alkyl of from 1 to 6 carbon atoms, inclusive, and R_3 and R_4 can be joined together to form a heterocyclic ring selected from the group consisting of morpholine, pyrrolidine or piperidine; X is oxygen or sulfur; A and B are the same or different, and are hydrogen, alkyl of from 1 to 6 carbon atoms, inclusive, cycloalkyl of from 3 to 7 carbon atoms, inclusive, haloalkyl and halogen; Z is an alkyl group of from 1 to 6 carbon atoms, inclusive, or a cycloalkyl group of from 3 to 7 carbon atoms provided that when A and B are halogen, Z is located at the 4 or 5 positions.

3,957,481

HERBICIDAL MIXTURE OF TERBUTRYN AND METOBROMURON

Jack Bollinger, Montpellier; Jean-Pierre Pigot, St. Germain-en-Laye, and Jean Vial, Fontenay-le-Fleury, all of France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 11, 1973, Ser. No. 369,041

Claims priority, application France, June 9, 1972, 72.20802

Int. Cl.[2] A01N *9/22*

U.S. Cl. 71—93 **4 Claims**

1. A herbicidal composition for controlling weeds in crop plants which consists essentially of 2-methylthio-4-ethylamino-6-tert.butylamino-s-triazine and N-(p-bromophenyl)-N'-methyl-N'-methoxy urea in substantially equal amounts by weight.

3,957,482

REDUCTION OF METAL OXIDE MATERIALS

William Whigham, 200 de Gaspe, Apt. 1417, Nuns'Island, Quebec, Canada

Continuation-in-part of Ser. No. 320,891, Jan. 4, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,877

Claims priority, application United Kingdom, Jan. 12, 1972, 1378/72

Int. Cl.[2] B22F *9/00*

U.S. Cl. 75—.5 BA **18 Claims**

1. In a method of forming iron powder by reducing finely divided iron oxide powder using a gaseous reducing agent in which hydrogen is a major component, in a heated furnace wherein said oxide is reduced in said furnace by passing the same through said furnace so that said oxide is substantially reduced to the metallic form by reacting with the reducing gas to form steam and/or carbon monoxide and/or carbon dioxide gases all of which are denser than said reducing gas, the improvement comprising the steps of coating the iron oxide powder with an additive capable of liberating elemental carbon under the reducing conditions encountered in said furnace, forming a self-supporting layer of said finely divided iron oxide powder in the form of a layer or cake of the same on a perforated movable supporting means on which said finely divided iron oxide powder may be supported without substantial loss of said powder through said perforated supporting means, and passing said iron oxide powder on said supporting means through said furnace and exposing the same to said gaseous reducing agents in said furnace, permitting the steam, carbon monoxide and carbon dioxide to penetrate through said supporting means by gravity flow and thereby permit continuous penetration of said oxide layer or cake by gaseous reducing agents, said layer of finely divided iron oxide powder being a cohesive self-supporting layer or cake under the reducing conditions encountered in said furnace, and when said layer or cake is initially formed on said supporting means, said layer or cake being non-self-supporting.

3,957,483

MAGNESIUM COMPOSITES AND MIXTURES FOR HYDROGEN GENERATION AND METHOD FOR MANUFACTURE THEREOF

Masahiro Suzuki, 423, Yasaka, Kakegawa, Shizuoka, Japan

Continuation-in-part of Ser. No. 242,790, April 10, 1972, abandoned. This application Mar. 14, 1974, Ser. No. 451,141

Claims priority, application Japan, Apr. 16, 1971, 46-24353; Oct. 25, 1971, 46-84364

Int. Cl.[2] B22F 9/00; C01B 1/07

U.S. Cl. 75—.5 R 2 Claims

1. A method for the manufacture of a magnesium particulate, foil, ribbon or plate composite capable of inducing generation of hydrogen upon reaction with water in the presence of one member selected from the group consisting of NaCl and KCl, which method is characterized by placing said magnesium particles, foils, ribbons or plates in a container in conjunction with an iron powder selected from the group consisting of iron and iron oxide having a particle diameter not larger than 200 mesh and applying mechanical force whereby 0.01 to 30% of said iron powder is embedded in said magnesium particles, foils, ribbons or plates.

3,957,484

FLUID BED ROASTING OF METAL SULPHIDES AT HIGH TEMPERATURES

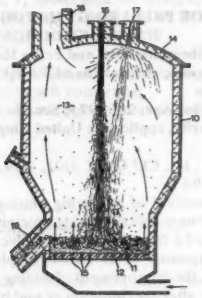
Simon Otto Fekete, 7277 W. 83rd Way, Arvada, Colo. 80003; Colin Bruce MacKenzie, 8 MacDonnell St., Falconbridge, Ontario, Canada; Philip George Thornhill, 210 Arnold Ave., Thornhill, Ontario, Canada; Edward Howard Coulter, 11 Jeremy Drive, Unionville, Ontario, Canada (L3R 2K7), and Kenneth Leslie Agnew, 21 Hodge St., Apt. 4, Falconbridge, Ontario, Canada

Filed Sept. 18, 1974, Ser. No. 507,034

Claims priority, application Canada, Oct. 9, 1973, 182863

Int. Cl.[2] C22B 1/10

U.S. Cl. 75—9 13 Claims



1. A method for roasting particulate metal sulphides in a fluid bed reactor containing a fluidized bed of hot roasted calcine particles and a freeboard space between the bed and the top of the reactor comprising:

i. feeding a free oxygen-containing gas upwardly through the reactor thereby maintaining the fluidized bed;

ii. feeding an aqueous slurry of metal sulphide particles onto the surface of the fluidized bed thereby supplying both water and sulphide to the bed,

iii. both evaporating a majority of the slurry water in the hot bed thereby forming agglomerates of sulphide particles that become dispersed in the bed as evaporation occurs and roasting the sulphide, while controlling the rates of feeding free oxygen-containing gas, water and sulphide to the bed to control temperatures in the bed and in the freeboard space such that fusion occurs during roasting thereby forming roasted calcine agglomerate particles of controlled size and rounded shape.

iv. recovering the roasted calcine agglomerate particles from the bed, and

v. recovering sulphur dioxide-containing gas from the freeboard space.

3,957,485

REDUCTION SMELTING OF MANGANESE NODULES WITH A LIQUID REDUCTANT

Thomas C. Wilder, Cambridge, Mass., and Walter E. Galin, Pawtucket, R.I., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Oct. 15, 1974, Ser. No. 514,614

Int. Cl. C21b 1/00

U.S. Cl. 75—21 8 Claims

1. A process for treating manganese nodules comprising the following steps:

a. providing nodules having the following ingredients

Copper	0.8 – 1.8 wt.%
Nickel	1.0 – 2.0 wt.%
Cobalt	0.1 – 0.5 wt.%
Molybdenum	0.03 – 0.1 wt.%
Manganese	10.0 – 40.0 wt.%
Iron	4.0 – 25.0 wt.%

b. mixing the nodules with bunker C oil so that the bunker C oil is absorbed by the nodules and makes intimate contact with the metals in the nodules, which amount of bunker C oil is such that the ratio of the weight percent of bunker C oil divided by the weight percent of copper plus nickel plus cobalt in the nodule is within the range of 0.95 to 2.30;

c. charging the nodules containing the absorbed bunker C oil into a furnace;

(d). heating the nodules in the furnace to enable the bunker C oil to reduce copper, nickel, cobalt and molybdenum values and form a liquid alloy;

e. withdrawing the liquid alloy from the furnace; and,

f. cooling the liquid alloy to produce an alloy containing an iron rich major phase containing nickel and cobalt, a first minor phase containing 80–90 wt.% copper with the remainder of the phase containing nickel and iron, and a second minor phase containing iron, nickel, manganese, cobalt and molybdenum.

3,957,486

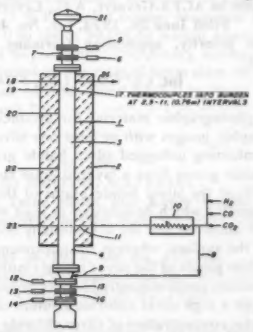
METHOD OF REDUCING IRON ORE

Jesus A. Sandoval, Hempfield Township, Westmoreland County, and Robert J. Rygiel, Monroeville, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 9, 1974, Ser. No. 496,223

Int. Cl.[2] C21B 13/02

U.S. Cl. 75—34 11 Claims



1. In a method of reducing iron ore pellets in a vertical shaft moving bed furnace having a countercurrent reducing gas flow, the improvement wherein erratic burden movement is inhibited thus permitting higher furnace operating temperatures and productivity, comprising introducing as the principal source of iron ore a burden of fired iron ore pellets having a

porosity of at least 21½% and made by firing green iron ore pellets formed from an iron ore concentrate having a silica content no greater than 2½% with 1.0% to 8.5% finely ground limestone or dolomite and bentonite as a binder, said green pellets having from 7 to 12% moisture.

3,957,487

HOLDING THE TEMPERATURE OF METAL MELTS OF SPECIFIED COMPOSITIONS

Rudolf Gesek; Walter Fadler, both of Vienna, Austria, and Georg Bohm, Heddesheim, Germany, assignors to Elin-Union Aktiengeselischaft fur Elektrische Industrie, Vienna, Austria

Division of Ser. No. 246,545, April 24, 1972, Pat. No. 3,819,842. This application Apr. 17, 1974, Ser. No. 461,601

Int. Cl.² C21C 7/10

U.S. Cl. 75—49 **5 Claims**

1. A method for maintaining the temperature level of steel melts comprising the steps of

a. excluding oxygen access to the melt contained in the furnace;

b. slowly displacing the atmospheric air from above the melt surface by introducing an inert protective gas in laminar flow without the generation of turbulence, in a volume equal to 2.5–5 times the volumetric capacity of the furnace and at air excess pressure of substantially 1.5 atm., the time of displacement being about 30 minutes per each cubic meter in order to reduce the oxygen content from atmospheric to 0.1%; and

c. thereafter maintaining above the melt surface a pure protective gas atmosphere at an excess pressure of substantially 0.5 atm. by blowing in more protective gas to meet the consumption of between 0.1 and 1% of the volumetric capacity of the furnace per minute this permitting the melt to be cast without oxidation of the alloying components and without increase in its gas content, even hours after having been melted down.

3,957,488

PHOTOGRAPHIC EMULSION CONTAINING UNFOGGED, HETERODISPERSE LAYERED SILVER HALIDE GRAINS HAVING A PRODOMINANTLY BROMIDE CORE AND TOTAL CHLORIDE CONTENT LESS THAN 30 MOLE PERCENT

Sieghart Klötzer, and Erik Moisar, both of Cologne, Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed June 24, 1974, Ser. No. 482,437

Claims priority, application Germany, June 28, 1973, 2332802

Int. Cl.² G03C 1/02, 5/24

U.S. Cl. 96—64 **6 Claims**

1. A photographic material for producing direct positive photographic images with at least one silver halide emulsion layer containing unfogged silver halide grains, in which the silver halide grains have a layered grain structure wherein at least 10% of the silver halide grains of the emulsion have a grain diameter which deviates by at least 40% from the average grain diameter and are substantially not chemically sensitized on the surface, wherein the improvement comprises the silver halide grains of the silver halide emulsion contain a core which consists predominantly of silver bromide and a localised phase with a high silver chloride content of at least 20 mols-%, the total concentration of silver chloride, based on the total silver halide content of the grain, is less than 30 mols-%, and the silver halide grains are on the surface not or only to such an extent chemically sensitized that they are developable after exposure stepwise for 1/100 th to 1 second and developed for 3 minutes at 20°C in the internal developer of the following composition:

hydroquinone	15g
monomethyl-p-aminophenol sulfate	15g
sodium sulfite (anhydrous)	50g
potassium bromide	10g
sodium hydroxide	25g
sodium thiosulfate (cryst)	20g
water up to 1000 ml	

to reach a maximum density which is at least three times than that obtained when developing a similarly exposed material for 4 minutes at 20°C in the surface developer of the following composition:

p-hydroxyphenyl glycine	10g
sodium carbonate (cryst.)	100g
water up to 1000 ml.	

3,957,489

SOLVENT SOLUBLE DIAZONIUM METAL SALTS AND DIAZOTYPE MATERIALS THEREFOR

Ralph Gower Davies Moore, Chenango Forks, N.Y., assignor to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 759,195, Sept. 11, 1968, Pat. No. 3,664,474. This application Mar. 24, 1972, Ser. No. 237,890

The portion of the term of this patent subsequent to May 30, 1989, has been disclaimed.

Int. Cl.² G03C 1/54; G07C 113/04

U.S. Cl. 96—91 R **10 Claims**

1. A light-sensitive 3-phenoxy benzenediazonium salt selected from the group consisting of 3-phenoxy-4-(1-pyrrolidinyl) benzenediazonium hexafluoroarsenate, 4-dimethylamino-3-phenoxybenzenediazonium hexafluoroarsenate, 3-phenoxy-4-piperidinobenzenediazonium hexafluoroarsenate and 4-morpholino-3-phenoxybenzenediazonium hexafluoroarsenate.

3,957,490

METHOD OF PREPARING PHOTOGRAPHIC SILVER HALIDE EMULSIONS

Marcel Jan Libeer, Mortsel, and Frans Henri Claes, Boechout, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Apr. 25, 1974, Ser. No. 464,230

Claims priority, application United Kingdom, Apr. 26, 1973, 19950/73

Int. Cl.² G03C 1/02, 1/24, 1/30

U.S. Cl. 96—94 R **9 Claims**

1. In the method of preparing photographic silver halide emulsions by the steps comprising precipitating silver halide in the presence of a reducing agent for silver halide and subjecting the precipitated silver halide to physical ripening and grain-growth, the improvement of adding an oxidizing agent to said emulsion after precipitation of said halide in the presence of said reducing agent has been initiated but before the precipitated grains have reached their ultimate size.

3,957,491

SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING AN ORGANIC COMPOUND HAVING A COVALENT NITROGEN-HALOGEN BOND AS SENSITIZER

Reiichi Ohi; Keiichi Adachi; Norihiko Katoh; Kimitaka Kameoka; Mitsunori Sugiyama, and Toshiaki Aono, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sept. 4, 1973, Ser. No. 394,013

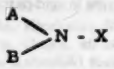
Claims priority, application Japan, Sept. 4, 1972, 47-88526

Int. Cl.² G03C 1/28

U.S. Cl. 96—107 **20 Claims**

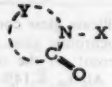
1. A silver halide photographic emulsion containing an organic compound having a covalent nitrogen-halogen bond,

said organic compound is represented by the general formula (I)



(I)

wherein X represents a halogen atom; A represents a hydrogen atom, an alkali metal atom, a R—CO— group, or a R—SO_2— group; B represents a R′—CO— group, a R′—SO_2— group, or R′; and R and R′ each represents a non-metallic atomic group selected from the class consisting of an alkyl group having 1–8 carbon atoms, a phenyl group, a naphthyl group or a pyridine group; said R and R′ may combine to form a heterocyclic ring of the general formula



wherein Y represents the non-metallic atoms necessary to form a 5-, 6-, or 7-membered ring with said

moiety, said organic compound being present in an amount sufficient to increase photosensitivity without increasing fog.

3,957,492

PHOTOGRAPHIC SILVER HALIDE EMULSION COMPRISING AN AMPHOTERIC COPOLYMER

Takushi Miyazako; Nobuo Tsuji; Tohru Sueyoshi, and Yasuo Inoue, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 7, 1974, Ser. No. 431,525

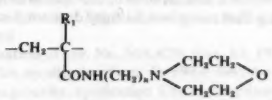
Claims priority, application Japan, Jan. 8, 1973, 48-5008

Int. Cl.² G03C *1/72, 1/78*

U.S. Cl. 96—114 **16 Claims**

1. A silver halide photographic emulsion containing an amphoteric copolymer which comprises:

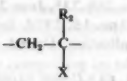
a. 0.5 to 30 mole % of cation-site containing repeating units of the formula (I)



(I)

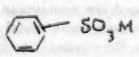
wherein R_1 represents a hydrogen atom or a methyl group and *n* is 1, 2, 3 or 4:

b. 0.5 to 30 mole % of anion-site containing repeating units of the formula (II)



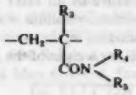
(II)

wherein R_2 represents a hydrogen atom or a methyl group, and X represents



—COOM, —SO_3M or —$COO(CH_2)_mSO_3M$, where M is a cation and *m* is 3 or 4; and

c. the balance of repeating units of the formula (III)



(III)

where R_3 represents a hydrogen atom or a methyl group, R_4 and R_5 each represents a hydrogen atom, a lower alkyl group or a substituted alkyl group thereof wherein the substituents are selected from hydroxy, halogen, alkoxy, aryl, alkoxycarbonyl, oxo, acyloxy, acyl, acylamino or cyano, with the proviso that when one of R_4 or R_5 is a group containing a tertiary carbon atom the other of R_4 or R_5 is a hydrogen atom.

3,957,493

THERMODEVELOPABLE PHOTOGRAPHIC MATERIAL WITH N-HALOACETAMIDE

Takao Masuda, Asaka, and Keiichi Adachi, Minami-ashigara, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 26, 1973, Ser. No. 427,612

Claims priority, application Japan, Dec. 26, 1972, 48-2842

Int. Cl.² G03C *1/02, 1/34, 1/76*

U.S. Cl. 96—114.1 **20 Claims**

1. A thermodevelopable light-sensitive material comprising a support having thereon at least one layer containing (a) an organic silver salt selected from the group consisting of silver salts of organic compounds containing an imino group, a mercapto group or a carboxyl group; (b) from about 0.001 to about 0.5 mol, per mol of said organic silver salt of a light-sensitive silver halide or compound capable of forming a light-sensitive silver halide by reaction with said organic silver salt; (c) a reducing agent suitable for reducing said organic silver salt to a silver image when heated in the presence of said silver halide after said silver halide has been exposed; (d) a binder and, (e) an N-haloacetamide in an amount of from about 10^{-4} mol to 1 mol per mol of said organic silver salt.

3,957,494

CHROMATED COPPER ARSENATE WOOD PRESERVATIVE COMPOSITIONS

William J. Oberley, Monroeville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Sept. 30, 1974, Ser. No. 510,493

Int. Cl.² C09D *5/14*

U.S. Cl. 106—15 R **4 Claims**

1. In a chromated copper arsenate wood treating solution of the type comprising as active ingredients from about 40.0 to about 70.0 % by weight chromium measured as CrO_3, from about 15 to about 23 % by weight copper measured as CuO and from about 14.0 to about 50.0% by weight arsenic measured as As_2O_5; the improvement comprising having in said solution trivalent chromium in a ratio of hexavalent chromium to trivalent chromium of from about 4.0:1.0 to about 1.0:1.0 and a pH below about 2.0.

3,957,495

SOLID WRITING MATERIAL

Takeshi Teranishi; Tatuo Ishiki, and Kunio Kosaki, all of Nagoya, Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Japan

Filed May 24, 1974, Ser. No. 473,298

Claims priority, application Japan, May 26, 1973, 48-58802

Int. Cl.² C09D *11/06, 11/12, 13/00*

U.S. Cl. 106—19 **7 Claims**

1. In a writing instrument containing a writing material in solid form made by dispersing, in a solid vehicle, a non-volatile oily solvent containing a substantially colorless electron donative chromogenic compound which develops color upon contact with an electron accepting substance on a writing surface, the improvement wherein more than 50% by weight

of the solid vehicle is a mixture of an ester of a higher (hydroxy) fatty acid and a microscrystalline wax, and the nonvolatile oily solvent is contained in the writing material in a quantity of from 10% to 50% by weight of the writing material.

3,957,496

MOLYBDENUM SEALING GLASS-CERAMIC COMPOSITION

Robert J. Eagan, Cedar Crest, N. Mex., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 23, 1975, Ser. No. 615,961
Int. Cl.² C03C *3/22, 3/04, 3/30*
U.S. Cl. 106—39.8 **5 Claims**

1. A glass-ceramic of low helium permeability and high modulus of rupture, of composition consisting essentially of from about 38 to about 42 weight percent silicon dioxide, from about 8 to about 10 weight percent aluminum oxide, from about 2 to about 4 weight percent calcium oxide, from about 2 to about 4 weight percent magnesium oxide, from about 4 to about 6 weight percent barium oxide, from about 30 to about 35 weight percent zinc oxide, from about 2.0 to about 2.8 weight percent sodium oxide, from about 0.2 to about 0.4 weight percent cobalt oxide, from about 0.5 to about 2.0 weight percent titanium dioxide, and from about 2.5 to about 3.5 of at least one of the oxides of phosphorous pentoxide and zirconium oxide.

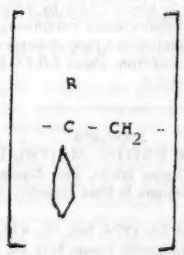
3,957,497

POLYMERIC BASED COMPOSITION

Don N. Gray, Sylvania, Ohio, and John D. Grier, Okemos, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 806,320, March 11, 1969, Pat. No. 3,661,615. This application Dec. 4, 1970, Ser. No. 95,329
Int. Cl.² C03C *5/02*
U.S. Cl. 106—48 **16 Claims**

1. A polymeric based composition comprising finely-divided, particulate inorganic material comprising at least in part a reducible metal oxide selected from alkali metal oxides, boric oxide and lead oxide, said inorganic material being capable of fusion at a predetermined temperature and being dispersed in a low molecular weight, low vapor pressure, liquid polymer having a molecular weight of less than 1000 and consisting of polystyrene or a poly(alpha-substituted)styrene having the structure



where *n* is an integer greater than 1 and R is selected from alkyls of less than six carbons, said polymer having both relatively constant viscosity and thixotropic character and capable of being pyrolyzed to gaseous products at a temperature below said predetermined fusing temperature of said particulate inorganic material without the formation of a carbonaceous residue reducing said metal oxide in said particulate inorganic material to its elemental state.

3,957,498

BORON-FREE SILVER HALIDE PHOTOCHROMIC GLASSES

Richard F. Reade, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed July 16, 1975, Ser. No. 596,433
Int. Cl.² C03C *3/04, 3/26*
U.S. Cl. 106—52 **4 Claims**

1. An alkali aluminosilicate glass composition suitable for the production of photochromic glass articles consisting essentially, in weight percent on the oxide basis, of about 45–56% SiO_2, 17–25% Al_2O_3, 4–14% Na_2O, 0–12% K_2O, 0–3.0% Li_2O, 13–21% total of $Li_2O + K_2O + Na_2O$, 0–7% ZnO, 0–6% P_2O_5, 1.5–9.5% F, 5–10% total of P_2O_5 + F, 0.2–1.5% Ag, 0.15–5.0% Cl, 0–1% Br, and 0.008–0.16% CuO.

3,957,499

FAST-FADING INDEX-CORRECTED PHOTOCHROMIC GLASS COMPOSITIONS

Clark V. DeMunn; David J. Kerko, and Ralph A. Westwig, all of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 11, 1974, Ser. No. 522,494
Int. Cl.² C03C *3/26, 3/08;* **G02B** *1/08*
U.S. Cl. 106—54 **1 Claim**

1. A photochromic glass consisting essentially, in weight percent as calculated from the batch, of about 49–60% SiO_2, 2–9% Al_2O_3, 15–18% B_2O_3, 6–12% Na_2O, 9–18% ZrO_2, 0.50–0.90% Ag, 0.50–0.80% Cl, 0.010–0.030% CuO, 0.3–1.0% PbO, the foregoing ingredients constituting at least 94% by weight of the glass, 0–6% K_2O, 0–3% Li_2O, 0–4% BaO, 0–1% MgO, 0–2% TiO_2, 0–0.5% Br and 0–0.5% I, said glass having an index of refraction (n_D) between about 1.52–1.54, and demonstrating, in 2 millimeter cross-section, an optical density loss during a five-minute fading interval from a fully darkened state which is at least 65% of the optical density gain developed during darkening to said fully darkened state.

3,957,500

STABILISED ZIRCONIA AND A PROCESS FOR THE PREPARATION THEREOF

Frank Pitts, Salford, England, assignor to Magnesium Elektron Limited, Manchester, England

Continuation of Ser. No. 266,735, June 27, 1972, abandoned. This application Apr. 15, 1974, Ser. No. 461,232
Claims priority, application United Kingdom, June 29, 1971, 30399/71
Int. Cl.² C04B *35/48*
U.S. Cl. 106—57 **13 Claims**

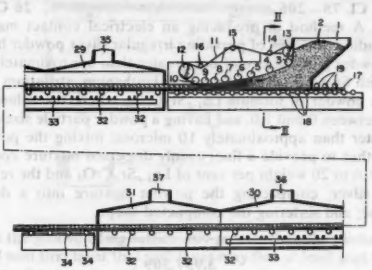
1. A stabilised zirconis body consisting essentially of zirconia and an impure yttria concentrate containing from 35% to 70% by weight yttria and the remainder consisting substantially of heavy and light rare earth metal oxides and 1 to 5% by weight of impurities, the concentrate being prepared from a naturally occuring mineral material containing yttrium and rare earth metals present in a quantity sufficient to provide a total of at least 3 mole% of yttria and heavy rare earth metal oxides in the zirconia body.

3,957,501

NON-COMBUSTIBLE LIGHT-WEIGHT INORGANIC SHAPED ARTICLES AND PROCESS OF MANUFACTURE

Tadashi Matsuda, Hirakata; Kazuo Tanaka, Nagaoka, and Kazuma Taura, Osaka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Sept. 26, 1972, Ser. No. 292,452
Claims priority, application Japan, Oct. 2, 1971, 46-77373
Int. Cl.[2] B29D *27/00*; C04B *21/00*, *35/16*
U.S. Cl. 106—75 10 Claims



1. A method of producing a non-combustible light weight shaped article, which consists essentially of shaping a mixture consisting essentially of:

a. 100 parts by weight of powders of silicon or a silicon alloy containing at least 50% by weight of silicon,

b. 100–200 parts by weight of inorganic powders having a porous or hollow structure,

c. 100–1200 parts by weight of water glass,

d. up to 80 parts by weight, per 100 parts by weight of the sum total of (a), (b) and (c), of a fibrous material and

e. up to 80 parts by weight, per 100 parts by weight of the sum total of (a), (b), and (c), of a fire-proofness improving agent;

compressing the resulting shaped article until the bulk density of the shaped article is increased to 1.5 to 12 times that before shaping; and

maintaining the resulting shaped article at a temperature of 15°–120°C. thereby to foam and cure it.

3,957,502

ADDITION OF MAGNESIUM TO MOLTEN METAL

Geoffrey Maurice Cull, Salford, and Phillip Andrew Fisher, Urmston, both of England, assignors to Magnesium Elektron Limited

Continuation of Ser. No. 305,679, Nov. 13, 1972, abandoned.
This application Sept. 9, 1974, Ser. No. 504,109
Claims priority, application United Kingdom, Nov. 17, 1971, 53409/71; Nov. 17, 1971, 53410/71; Oct. 13, 1972, 47350/72; Oct. 13, 1972, 47352/72
Int. Cl.[2] C22C *33/08*; C21C *7/00*
U.S. Cl. 75—58 16 Claims

1. A magnesium based additive for a ferrous melt comprising

a structure of magnesium particles together with means to diffuse the magnesium progressively and uniformly in a controlled manner as vapor into the ferrous melt, said means to diffuse comprising an adherent coating of particles of a refractory material inert to magnesium at the melting point of the latter,

the particles of refractory material being bonded to and substantially enveloping the magnesium particles and forming a coherent metal-permeable matrix through which the magnesium must pass when said structure is subjected to the temperature of a ferrous melt, and which refractory coating remains stable at least during the period said magnesium adjacent thereto passes therethrough, wherein the surface of said structure is substantially free of said magnesium.

3,957,503

EXTRACTION OF ZINC AND LEAD FROM THEIR SULFIDES

Rollan Swanson, 666 Salem Ave., Elizabeth, N.J. 07208

Filed May 6, 1974, Ser. No. 467,099
Int. Cl.[2] C22B *13/00*
U.S. Cl. 75—77 11 Claims

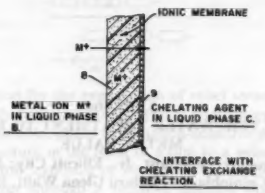
1. A process for extracting zinc and/or lead from a sulfidic ore thereof, comprising smelting said ore under vacuum in the absence of water, CO_2 and oxygen with a flux consisting of the tetrasulfide of sodium or potassium thereby liberating said zinc and/or lead in the free state and forming the pentasulfides of said potassium or sodium and separating the zinc and/or lead from the pentasulfide.

3,957,504

MEMBRANE HYDRO-METALLURGICAL EXTRACTION PROCESS

Win-Sow Ho, Wharton; Lester T. C. Lee, Parsippany, and Kang-Jen Liu, Somerville, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Nov. 11, 1974, Ser. No. 522,826
Int. Cl.[2] C22B *15/08*, *60/08*
U.S. Cl. 75—101 BE 28 Claims



1. A process for the recovery of metal values from a solution thereof in a first liquid phase which comprises the steps of contacting one side of a membrane with a first liquid phase containing a metal M dissolved therein, contacting the other side of said membrane with an extracting second liquid phase, wherein one of said phases is an organic liquid which contains a chelating agent which forms a complex with said metal and wherein the other phase is an aqueous liquid, and extracting said metal from said first liquid phase through said membrane by maintaining said liquids on the respective sides of said membrane until said metal M has substantially diffused from the first to the second phase.

3,957,505

GOLD RECLAMATION PROCESS

Richard P. Homick, San Francisco, Calif., and Hilbert Sloan, Scottsdale, Ariz., assignors to Bayside Refining and Chemical Company, Santa Clara, Calif.

Filed Aug. 5, 1974, Ser. No. 494,794
Int. Cl.[2] C22B *11/00*
U.S. Cl. 75—108 16 Claims

8. A process for extracting gold from gold bearing material which comprises:

treating the gold bearing material in an aqueous solution consisting essentially of 10 parts of water, 1 part of iodine and between 0.7 and 20 parts of potassium iodide, on a weight basis, to dissolve gold from said gold bearing material;

mixing hydrazine and sodium hydroxide to said aqueous solution to reduce dissolved gold iodide salts to gold metal and precipitate said gold metal in substantially pure form from said aqueous solution,

removing precipitated gold metal from said aqueous solution; and

adding hydrogen peroxide to said aqueous solution to thereby restore said solution to substantially its original condition for reuse in dissolving gold from further gold bearing material.

9. A process for extracting gold from gold bearing material which comprises:

treating the gold bearing material in an aqueous solution consisting essentially of iodine and a water soluble iodide salt to dissolve gold from said gold bearing material;

mixing a reducing agent with said aqueous solution in the presence of buffer to reduce dissolved gold iodide salts to gold metal and precipitate said gold metal in substantially pure form from said aqueous solution, said buffer being capable of supplying hydroxyl ions during the precipitation of the gold metal;

removing precipitated gold metal from said aqueous solution; and

adding an oxidizing agent to said aqueous solution in the presence of buffer to thereby restore said solution to substantially its original condition for dissolving gold from further gold bearing material, said buffer being capable of supplying hydrogen jons during the restoration of said solution.

3,957,506
CATALYTIC WATER TREATMENT TO RECOVER METAL VALUE

Joseph Theodore Lundquist, Jr., Ellicott City; James Michael Maselli, Columbia, and Dillard Glenn Whitt, Highland, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Sept. 11, 1974, Ser. No. 504,466
Int. Cl.² C22B *11/04, 15/12*
U.S. Cl. 75—108 **3 Claims**

1. A continuous reduction process for recovering gold or copper from an aqueous solution which comprises:

co-currently contacting the aqueous solution containing said metal in a reactor at a temperature of 10° to 80°C. with a metal catalyst consisting essentially of 0.02 to 1 Wt % Pt on a porous carbon support in the presence of a stoichiometric excess of hydrogen substantially dissolved in the aqueous solution at a flow rate of up to 1 volume of solution per minute per volume of bed, depositing free metal on the catalyst, and separating the recovered metal from the catalyst.

3,957,507
OXIDATION RESISTANT REFRACTORY ALLOYS

Jack L. Blumenthal, Los Angeles; John R. Ogren, La Palma, and Marvin Appel, Redondo Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 29,893, April 20, 1970, Pat. No. 3,713,901. This application June 14, 1972, Ser. No. 262,767
Int. Cl. C22c *15/00, 27/00*
U.S. Cl. 75—134 N **5 Claims**

1. A high-temperature oxidation-resistant refractory alloy consisting essentially of 35 – 95% by weight of hafnium, 5.0 to 50% by weight of zirconium and 0.1 to 15% by weight of at least one noble metal selected from the group consisting of platinum, gold, silver, rhodium, iridium, and palladium.

3,957,508
ELECTRICAL CONTACT MATERIALS

Terrence Ardern Davies, Horton, and Peter John Swallow, Blisworth, both of England, assignors to Square D Company, Park Ridge, Ill.

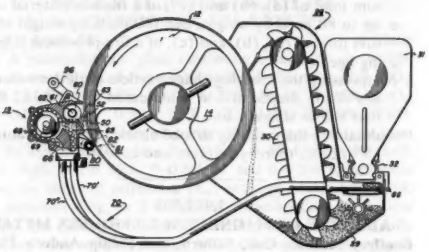
Division of Ser. No. 379,512, July 16, 1973, Pat. No. 3,893,821. This application Mar. 17, 1975, Ser. No. 558,755
Claims priority, application United Kingdom, July 18, 1973, 33656/73
Int. Cl.² B22F *1/00, 3/00*
U.S. Cl. 75—206 **26 Claims**

1. A method of producing an electrical contact material including the steps of providing irregular silver powder having a powder particle size of not greater than approximately 350 British Standard mesh; providing lanthanum, strontium chromite powder of formula $La_{1-x}Sr_xCrO_3$, where the values of x lie between 0 and 1.0, and having a powder particle size of not greater than approximately 10 microns; mixing the powders together to provide a fine, evenly dispersed mixture containing 1.0 to 20 weight per cent of $La_{1-x}Sr_xCrO_3$ and the remainder silver; compacting the powder mixture into a desired shape; and sintering the compacted shape.

3,957,509
METHOD AND APPARATUS FOR REMOVING CONTAMINANTS FROM AN ELECTROSTATIC IMAGING SURFACE

Thomas B. McMullen, Webster, and Robert L. Maness, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 30, 1974, Ser. No. 465,719
Int. Cl.² G03G *13/22, 15/22*
U.S. Cl. 96—1 R **14 Claims**



1. In a reproducing process including the steps of forming a latent electrostatic image on a moving electrostatic imaging surface; developing said latent electrostatic image to provide a visibl powder image; and transferring the powder image to a sheet of final support material; the improvement wherein these steps are followed by the steps of cleaning said imaging surface to remove residual toner particles and other particulate materials therefrom; and following said cleaning step removing contaminants from said surface by brushing said surface with a rotating brush while applying a normal force per unit fiber of the brush against said surface of at least 2 milligrams said brush being rotated at a peripheral speed of from about 0.1 to about 1.5 feet per second.

3,957,510
OVERFLOW PREVENTION FOR LIQUID BETWEEN FLEXIBLE LAYERS ON A SOLID SURFACE

Herman A. Hermanson, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

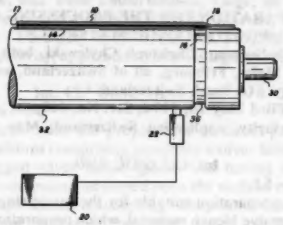
Filed Apr. 30, 1974, Ser. No. 465,644
Int. Cl.² G03G *17/04*
U.S. Cl. 96—1 PE **16 Claims**

1. Apparatus for preventing the overflow of liquid from

between flexible layers on a support surface comprising in combination:

a. first and second discrete, flexible layers having a layer of liquid sandwiched therebetween;

b. a support surface contacting said first layer and supporting said first layer; said support surface having at least one groove not beyond the adjacent edges of at least said first layer in contact with said support surface, the dimensions



of the groove being sufficiently greater than the thickness of said first layer that said layer may flex at least part way into the groove; and

c. means for exerting pressure across the sandwich at said support surface; whereby excess liquid, if any, can depress said first layer at the groove at least part way into the groove creating at the groove a depression for collecting a bead of the liquid.

3,957,511

METHOD FOR PRODUCING A VISIBLE IMAGE BY USE OF A PHOTOCONDUCTOR

Rimily Fedorovich Avramenko, Baltiiskaya ultisa 4, kv. 46, and Gurgen Ashotovich Askarian, Rozhdestvensky bulvar, 19, kv. 4, both of Moscow, U.S.S.R.

Filed July 30, 1974, Ser. No. 493,643

Claims priority, application U.S.S.R., July 31, 1973, 1949311

Int. Cl.² G03G *13/22*

U.S. Cl. 96—1 E **17 Claims**

1. A method for producing a visible image comprising:

a. disposing a photoconductor in an image producing medium said medium selected from the group consisting of:

1. electrolyte solutions, said electrolyte solutions selected from the group consisting of aqueous solutions of inorganic acids, alkali hydroxides, alkali metal salts and mixtures of inorganic acids and alkali metal salts;

2. liquids having a gas dissolved therein under pressure, said liquids being selected from the group consisting of electrolyte solutions as defined in (1), alcohols, propane and fluorocarbons, and said gas being selected from the group consisting of gases which are neutral relative to the electrolyte solution in which it is dissolved, nitrogen, oxygen and inert gases;

3. liquids approaching the conditions of boiling, said liquids being selected from the group consisting of water, alcohols, ether and liquified gases;

4. saturated and supersaturated mixtures of vapors in gases, said vapors being selected from the group consisting of alcohol and ether vapors, and said gases being selected from air and the inert gases;

b. applying an electric potential across said photoconductor;

c. subjecting said photoconductor and medium to image carrying radiation whereupon current and charges are formed therein and bubbles are generated in said liquid media and droplets are generated in said vapor media in response to the passage of current and charges in direct proximity to the surface of said photoconductor, said bubbles and droplets being concentrated in areas corresponding to the areas of greater irradiation of said photoconductor to thereby produce the image.

3,957,512

METHOD FOR THE PREPARATION OF RELIEF STRUCTURES

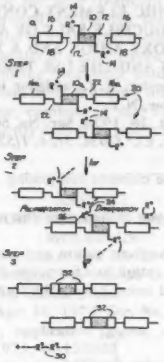
Wolfgang Kleeberg, Erlangen; Roland Rubner, Rottenbach, and Wieland Bartel, Furth, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 21, 1974, Ser. No. 444,552

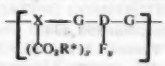
Claims priority, application Germany, Feb. 22, 1973, 2308830

Int. Cl.² G03C *1/68, 5/00*

U.S. Cl. 96—35.1 **10 Claims**



1. In a method for the preparation of relief structures consisting of highly heat resistant polymers comprising the steps of applying a soluble, photo or radiation-sensitive prepolymer of defined structure in the form of a film to a substrate or in the form of a foil, exposing or irradiating the photo or radiation active layer through a negative pattern, dissolving or stripping of the unexposed or unirradiated portions and annealing the relief structure obtained, the improvement which comprises forming said film or foil from a poly-addition or poly-condensation prepolymer having repeating units of the formula:



wherein, X and D each comprise a carbocyclic and/or heterocyclic nucleus;

G is selected from the group consisting of amide, urea or urethane linkages;

R* is an organic radical containing a photo- or radiation induced di- or polymerizable olefinic double bond;

and is a component of ester group CO_2R^*, said group bound to said nucleus is ortho or peri position to G;

F is a group capable of reacting with the carbonyl group of CO_2R^* to form a cyclic structure upon heating of the prepolymer to liberate R*OH; and wherein F is arranged in ortho- or periposition to G;

x is 1 or 2; and

y is 0 or 2.

3,957,513

METHOD OF FREE RADICAL PHOTOGRAPHY UTILIZING A SHORT LIGHT FLASH FOR EXPOSURE

Hidehiko Kobayashi, Fuji; Hidesaburo Genda, Tokyo, and Toshio Ishikawa, Chiba, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 18, 1974, Ser. No. 462,164

Claims priority, application Japan, Apr. 19, 1973, 48-43626; Jan. 29, 1974, 49-12012

Int. Cl.² G03C *5/24*

U.S. Cl. 96—48 QP **5 Claims**

1. A method of free radical photography which comprises exposing a photosensitive composition comprising a film-forming transparent plastic, a halogen-containing organic

compound capable of forming free radicals upon irradiation of light and a color former capable of reacting with the free radicals to produce color, and selected from the group consisting of an arylamine, a phenol and mixtures thereof, to a light flash with a light quantity of 5 to 500 millijoules per square centimeter for a flashing time of 0.0001 to 0.005 second through a negative or positive original to be reproduced, to thereby form a colored image instantaneously.

3,957,514

PHOTOGRAPHIC ELEMENT CONTAINING A PHOTOREDUCIBLE SALT OF AN ARYL HYDROXY-CARBOXY ANION AND A TETRAZOLIUM CATION AND THE USE THEREOF

Anthony Adin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 26, 1974, Ser. No. 509,615

Int. Cl.² G03C *5/24, 1/52*

U.S. Cl. 96—48 R **14 Claims**

1. A photosensitive element comprising

A. a support, and

B. at least one layer coated over the support, said layer comprising

a salt of a tetrazolium cation and an anion capable of reducing said cation to a formazan dye upon activating radiation, said anion having the formula

wherein Ar is an aromatic but not a heterocyclic radical containing from 6 to 10 carbon atoms, and

X is either Ar or hydrogen.

3,957,515

PHOTOGRAPHIC PROCESS FOR PRODUCING COLORED POLYMERIZED IMAGES

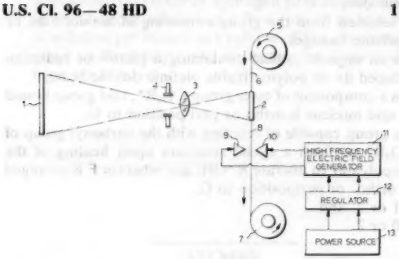
Jean-Jules Robillard, Ferney Voltaire, France, assignor to La Cellophane, Paris, France

Filed Mar. 14, 1975, Ser. No. 558,494

Claims priority, application France, Mar. 15, 1974, 74.08806

Int. Cl.² G03C *5/24, 5/04, 1/68*

U.S. Cl. 96—48 HD **1 Claim**



1. A photographic process comprising

a. providing a photosensitive element comprising a substrate, and a photosensitive composition on said substrate, said composition comprising a photopolymerizable system dispersed in a binder and a thermochromic substance;

b. exposing said photosensitive element with light according to an image having transparent areas and non-transparent areas to thereby cause polymerization of said photopolymerizable system only in those areas corresponding to the transparent areas of said image; and

c. passing said exposed photosensitive element through a high frequency electric field to selectively heat said polymerized areas to a temperature above the threshold temperature of said thermochromic whereby said thermochrome changes from a colorless or weakly colored form to a colored, stable form.

3,957,516

PREPARATION FOR THE PROCESSING OF PHOTOGRAPHIC MATERIALS

Matthias Schellenberg; Christoph Chylewski, both of Marly, and Max Meier, Fribourg, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed May 10, 1974, Ser. No. 468,837

Claims priority, application Switzerland, May 17, 1973, 7061/73

Int. Cl.² G03C *7/00*

U.S. Cl. 96—53 **2 Claims**

1. Liquid preparation suitable for the processing of photographic silver dye bleach material, which preparation substantially consists of an oil-in-water emulsion which comprises as an acitve substance, capable of exerting its action on the photographic material, a lipophilic dye bleach catalyst more readily soluble in the oily phase than in the aqueous one.

3,957,517

DRY STABILIZATION OF A SILVER HALIDE PHOTOGRAPHIC MATERIAL

Shinpei Ikenoue; Takao Masuda, and Masato Satomura, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

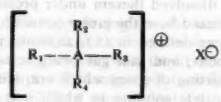
Filed Dec. 6, 1973, Ser. No. 422,386

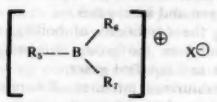
Claims priority, application Japan, Dec. 8, 1972, 47-123213

Int. Cl.² G03C *5/38*

U.S. Cl. 96—61 R **9 Claims**

1. A dry method for the stabilization of a print-out silver halide photographic material wherein the silver halide is the image-forming substance, which comprises (1) imagewise exposure of a silver halide photographic emulsion material to form a print-out image, wherein said silver halide photographic emulsion material consists essentially of silver halide grains at least 50 mol% of which consists of silver bromide and 0.1 to 33 mol%, based on the silver halide, of an onium compound having an iodine ion or an anion containing iodine, said onium compound being a member selected from the group consisting of compounds of the formulae





and

wherein A is N, P, As or Sb, B is O, S, SO, Se or Sn, and each of R_1 to R_9 is an alkyl group having less than 8 carbon atoms, or an aryl group having less than 16 carbon atoms, or of said R_1 to R_9 two groups can be connected to each other to form a ring selected from the group consisting of a pyridine ring, a morpholine ring, an oxazine ring, a thiazine ring, a thiazole ring, an oxazole ring, a benzothiazole ring and a benzoxazole ring, and wherein X is an iodine ion or an iodine containing anion; and subsequently (2) heating said photo-

graphic material to a temperature of at least 80°C, thereby stabilizing said print-out image.

3,957,518

DIRECT-POSITIVE SILVER HALIDE EMULSIONS

Willy Joseph Vanassche, Kontich; Herman Alberik Pattyn, Kapellen, and Yvon Louis Renotte, Liege, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed July 9, 1973, Ser. No. 377,298

Claims priority, application United Kingdom, July 13, 1972, 32889/72

Int. Cl.² G03C 5/24, 1/02, 1/28

U.S. Cl. 96—64 16 Claims

1. A method for the preparation of direct-positive silver halide emulsions comprising providing a silver halide emulsion having fogged silver halide grains and having an electron-accepting compound adsorbed onto the surface of said grains wherein said electron-accepting compound has an anodic polarographic half-wave potential and a cathodic polarographic half-wave potential which when added together give a positive sum; and the fogging of said grains having occurred at a pH value of 6.5 or higher, and at a pAg value of 8.2 or lower, and subsequent to said fogging of said grains and the addition of the electron-acceptor, lowering the pH of said emulsion to a value below 6.5 and increasing the pAg to a value above 8.2.

3,957,519

ACID AND HEAT-RESISTANT MORTARS FOR CELLULAR GLASS COMPOSITIONS AND PRODUCTS THEREFROM

Robert W. Linton, Export, Pa., assignor to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Filed May 31, 1974, Ser. No. 475,118

Int. Cl.² C04B 35/66

U.S. Cl. 106—85 6 Claims

1. An acid-resistant mortar composition for bonding cellular glass bodies comprising more than 50 percent by weight of a finely ground boro silicate cellular glass powder, said cellular glass powder having substantially the same composition as said cellular glass bodies, between about 35 and 40 percent by weight of a silica sol binder, and between about 1 and 3 percent by weight of a hardening agent selected from the group consisting of slowly hydrolyzable acidic and alkaline materials.

3,957,520

ACID AND HEAT-RESISTANT MORTARS FOR CELLULAR GLASS COMPOSITIONS AND PRODUCTS THEREFROM

Robert W. Linton, Export, Pa., assignor to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 475,118, May 31, 1974. This application Jan. 7, 1975, Ser. No. 539,115

Int. Cl.² C04B 19/00, 35/66

U.S. Cl. 106—85 9 Claims

1. An acid-resistant mortar composition for bonding cellular glass bodies comprising more than 50 percent by weight of a finely ground boro silicate cellular glass powder, said cellular glass powder having substantially the same composition as said cellular glass bodies, between about 35 and 40 percent by weight of a silica sol binder, between about 1 and 3 percent by weight of a hardening agent selected from the group consisting of slowly hydrolyzable acidic and alkaline materials, and a granular siliceous filler in the amount of about 30–100 parts by weight based upon the combined weights of said finely ground boro silicate cellular glass powder and said silica sol.

3,957,521

METHOD AND APPARATUS FOR THE HEAT TREATMENT OF FINE-GRAINED MATERIAL

Horst Ritzmann, Enniger, Germany, assignor to Polysius AG, Neubeckum, Germany

Filed Jan. 23, 1974, Ser. No. 435,845

Claims priority, application Germany, Feb. 13, 1973, 2307027

Int. Cl.² C04B 7/44

U.S. Cl. 106—100 8 Claims

1. A method for the heat treatment of dry, fine-grained material such as ground raw cement, said method comprising heating said material in a pre-heater; conveying heated material from said per-heater to a mixing zone; mixing said material with fuel in said mixing zone while maintaining non-conbustive conditions in said zone; delivering mixed material and fuel to a prefiring zone; combusting said fuel in said pre-firing zone; and subsequently delivering said material to a final firing zone.

3,957,522

PROCESS FOR PREPARING FIRE-RESISTING MOLDINGS

Masato Matsuo, Toyonaka, and Hiroki Yamakita, Hirakata, both of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 10, 1974, Ser. No. 459,724

Claims priority, application Japan, Apr. 24, 1973, 48-47458; Nov. 29, 1973, 48-135040

Int. Cl.² C04B 11/00; B28B 1/26

U.S. Cl. 106—109 5 Claims

1. A process for preparing fire-resisting moldings which comprises admixing gypsum with (i) a member selected from the group consisting of hydrothermally prepared xonotlite and tobermolite and mixtures of these in an amount of 5 to 100% by weight to said gypsum, and (ii) water to give a slurry; molding said slurry under pressure; and drying the resultant raw-shaped article.

3,957,523

COATING COMPOSITIONS FOR SOLID MEDICINES

Shigeru Ohno, Kamakura; Noboru Hoshi, Tokorozawa, and Fujio Sekigawa, Yono, all of Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

Filed Mar. 28, 1974, Ser. No. 455,533

Claims priority, application Japan, Apr. 2, 1973, 48-36638

Int. Cl.² C08L 1/12, 1/26

U.S. Cl. 106—189 12 Claims

1. A coating composition for a solid medicine comprising (1) an enterosoluble cellulose derivative having monoester linkages with a polybasic acid the amount of polybasic acid groups being from 20–40% by weight based on the cellulose derivative and (2) a digestive fluid-insoluble cellulose derivative, the mixing ratio of component (1) with component (2) being 30–70% by weight to 70–30% by weight.

3,957,524

CATIONIC BITUMINOUS EMULSIONS

Joseph B. Doughty, Sullivans Island, and Peter Dilling, Charleston, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Feb. 25, 1974, Ser. No. 445,066

Int. Cl.² C08K 5/19; C08L 95/00

U.S. Cl. 106—277 6 Claims

1. A cationic bituminous emulsion for mixing grade compositions which consists essentially of,

a. from about 30 to about 80% by weight of bitumen;

b. from about 0.1 to about 10.0% by weight of the emulsion of an emulsifier from the group consisting essentially of 3-(dodecyl phenoxy)-2 hydroxypropyl trimethyl ammonium chloride and 3-(dodecyl phenoxy)-2 hydroxypropyl triethyl ammonium chloride; and

c. the remainder being water, whereby the amount of said emulsifier is varied depending upon whether a slow, medium, or fast set emulsion is desired.

3,957,525

ROAD SURFACING MATERIALS

Geoffrey Lees, Stratford-upon-Avon, and Arthur Roger Williams, Birmingham, both of England, assignors to Dunlop Limited, London, England

Continuation of Ser. No. 245,159, April 18, 1972, abandoned. This application Mar. 11, 1974, Ser. No. 449,759

Claims priority, application United Kingdom, Apr. 24, 1971, 11237/71; Nov. 16, 1971, 53096/71

Int. Cl.[2] C08H *17/04*

U.S. Cl. 106—288 B 5 Claims

1. A road surfacing material comprising a blend of at least two aggregates of graded sizes up to not more than 1½ inches disposed in a binder matrix and having different rates of wear as judged by the aggregate test BS 812 1967,

the particles of each of said two aggregates exposed to the surface falling within different size ranges, the slower wearing aggregate comprising one portion of particles of larger size and another portion of particles of smaller size than any of the particles of the faster wearing aggregate.

3,957,526

TITANIUM DIOXIDE PIGMENTS AND FILLERS

Jonathan Howard Hodgkin, Burwood; David Geoffrey Hawthorne, South Oakleigh; Jean Drummond Swift, Olinda, and David Henry Solomon, Glen Waverley, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Division of Ser. No. 224,606, Feb. 8, 1972, Pat. No. 3,834,923. This application Feb. 19, 1974, Ser. No. 443,796

Claims priority, application Australia, Feb. 10, 1971, 3979/71; Feb. 10, 1971, 3981/71; Feb. 10, 1971, 3983/71; Feb. 10, 1971, 3985/71

Int. Cl.[2] C09C *1/36*

U.S. Cl. 106—300 12 Claims

1. Pigmentary titanium dioxide comprising the reaction product of

a. titanium dioxide particles coated with a compound of aluminium and having on their surface a number of acidic sites with pKa values of less than 2.8 and

b. an organic base.

3,957,527

COLOR DEVELOPING SUBSTRATES FOR MANIFOLD COPY SYSTEMS AND PROCESS FOR PRODUCING THE SAME

Andrew Torok, Parsippany, and Thomas F. Walsh, Florham Park, both of N.J., assignors to Georgia Kaolin Company, Elizabeth, N.J.

Filed July 29, 1974, Ser. No. 492,682

Int. Cl.[2] C09C *1/02, 1/42*

U.S. Cl. 106—306 11 Claims

1. An improved reactive color developing substrate for manifold copy systems comprising a dried coflocculated colloidalized acid treated smectite admixed with about 9 to 50 percent by weight of finely divided talc.

3,957,528

PROCESS FOR THE PRODUCTION OF AGGREGATES FOR CONCRETE BY UTILIZATION OF THE RESIDUES FROM THE COMBUSTION OF PREDOMINANTLY ORGANIC MATERIAL

Karl Ott, and Paul Maydl, both of Linz, Austria, assignors to Etablissement Thermocrete Baupatente Verwertungsgesellschaft, Vaduz, Liechtenstein

Filed Mar. 29, 1973, Ser. No. 345,947

Claims priority, application Austria, Mar. 30, 1972, 2772/72; Mar. 30, 1972, 2771/72; Germany, Nov. 9, 1972, 2254750

Int. Cl.[2] C09C *1/00*

U.S. Cl. 106—309 8 Claims

1. A process for the production of aggregates for concrete by utilization of the residues from the combustion of predominantly organic material comprising the steps of melting said residues, chilling the melting material by means of a cooling medium so that a vitreous granulated material is obtained, collecting said granulated material and crushing said granulated material to such an extent that the particles have a maximum size of 0.125 to 0.275 inches and the fraction of particles with a grain size smaller than 0.0025 inches is 0 to 25 percent, the fraction of particles with a grain size smaller than 0.008 inches is 5 to 40 percent and the fraction of particles with a grain size of 0.008 to 0.040 inches is 30 to 60 percent of the granulated material.

3,957,529

METHOD FOR CLEANING AND PASSIVATING A METAL SURFACE

George B. Alexander, and Norman F. Carpenter, both of Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 324,651, Jan. 18, 1973. This application June 3, 1974, Ser. No. 475,704

Int. Cl.[2] C23G *1/02*

U.S. Cl. 134—3 10 Claims

1. A method of cleaning a metal surface which comprises the sequence of steps:

a. contacting said surface for a sufficient period of time to clean said surface with a composition comprising in percentages by weight the following ingredients:

i. about 8 to 12% sulfamic acid;

ii. about 4 to 6% citric acid;

iii. about 4 to 6% of a nonionic solvent for hydrocarbon residues which solvent is characterized as not producing turbidity at 75°F when present in said composition;

iv. about 0.095 to 0.15% of a soluble nonionic surfactant which surfactant is characterized as having a cloud point of at least about 90°F and having a surface tension of about 32 dynes/cm. or less when present in an amount of 0.1% of said composition;

v. the balance, water;

b. rinsing said surface with water to remove residual composition; and

c. passivating the surface with a solution of citric acid and sodium nitrite.

3,957,530

TERNARY AZEOTROPIC PAINT STRIPPING COMPOSITIONS

Robert E. Reusser, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 338,417, March 6, 1973, Pat. No. 3,904,542. This application Mar. 31, 1975, Ser. No. 563,400

Int. Cl.[2] B08B *3/08;* C23D *17/00;* C23G *5/02*

U.S. Cl. 134—4 12 Claims

1. A process for removing paint from painted surfaces which comprises contacting said painted surface with a substantially constant boiling admixture comprising (A) 1,2-dichloro-1-fluoroethane, (B) acetone, and (C) methanol, characterized by a weight percent ratio of about 25 to 41 (A),

about 25 to 33 (B), and about 26 to 40 (C), thereby softening said paint, and thereafter removing said paint.

3,957,531
TWO TANK CLEANING PROCESS USING A CONTAMINATED CLEANING MIXTURE CAPABLE OF FORMING AN AZEOTROPE

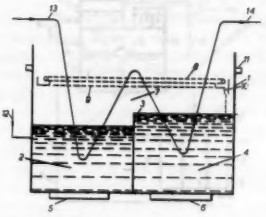
James William Tipping, and Bernard Patrick Whim, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 289,113, Sept. 14, 1972, abandoned. This application Mar. 14, 1975, Ser. No. 558,380

Claims priority, application United Kingdom, Sept. 27, 1971, 44876/71

Int. Cl.² B08B *3/08*, *3/10*

U.S. Cl. 134—11 **42 Claims**



1. A method of cleaning a contaminated article which comprises contacting the article with a first contaminated liquid mixture which is heated to at least 30°C., removing contamination from the article and accumulating the removed contamination in the first liquid mixture, said first liquid mixture containing a fluorinated hydrocarbon solvent and an organic auxiliary solvent which together can form an azeotrope and wherein the concentration of the auxiliary solvent in the mixture is greater than that of the azeotrope itself, and subsequently rinsing the article with a second liquid mixture containing the fluorinated hydrocarbon solvent and a proportion of the auxiliary solvent which is lower than that contained in the first liquid mixture but at least equal to the auxiliary solvent concentration of the azeotrope.

3,957,532
METHOD OF PREPARING AN ELECTRODE MATERIAL OF LITHIUM-ALUMINUM ALLOY

Jack L. Settle, Plainfield; Kevin M. Myles, Downers Grove, and James E. Battles, Oak Forest, all of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 20, 1974, Ser. No. 481,285

Int. Cl.² H01M *4/18*

U.S. Cl. 136—75 **9 Claims**

1. A method of preparing a uniform alloy composition of lithium and aluminum having at least 50 atom percent lithium for use as negative electrode material in a high-temperature electrochemical cell comprising:

melting lithium metal at a temperature substantially below the liquidus temperature of said alloy composition;

dissolving aluminum within the molten lithium while continuously increasing temperature with increasing aluminum concentration to maintain a liquid phase until a melt of said alloy composition is produced;

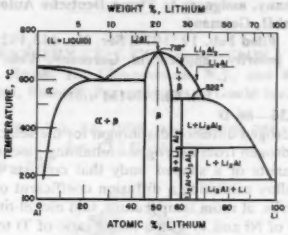
solidifying said melt by splat casting onto a surface;

breaking said solidified melt into fragments;

heating said fragments to a temperature near to but below the solidus temperature of said alloy composition to homogenize said fragments; and

comminuting said homogenized fragments to particles.

4. The method of claim 1 wherein said solidified melt is comminuted to particles of less than 500 microns in size and



blended with an electrolyte of alkali metal salts and pressed into a compact of essentially uniform lithium-aluminum distribution.

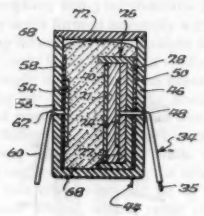
3,957,533
LITHIUM-IODINE BATTERY HAVING COATED ANODE

Ralph T. Mead, Kenmore; Wilson Greatbatch, Clarence, and Frank W. Rudolph, Depew, all of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.

Filed Nov. 19, 1974, Ser. No. 525,051

Int. Cl.² H01M *4/36*

U.S. Cl. 136—83 R **13 Claims**



1. A lithium-iodine cell comprising:

a. an anode including a lithium element having an operative surface;

b. a protective coating on said lithium anode operative surface of an organic electron donor component material;

c. a cathode including a charge transfer complex of an organic donor component and iodine, said charge transfer complex material operatively contacting said lithium anode operative surface through said protective coating;

d. said protective coating preventing recrystallization of iodine on said lithium anode operative surface so as to maximize the area of said lithium anode surface operatively contacted by said charge transfer complex material.

7. A method of making a lithium-iodine cell wherein the cathode contains a charge transfer complex of an organic donor component and iodine comprising the steps of:

a. providing an anode including a lithium element having a surface adapted to be operatively associated with the cathode in the cell;

b. applying a coating to said anode surface, said coating including an organic electron donor component material; and

c. placing said anode and a cathode current collector in a casing in spaced-apart relation and introducing a cathode including a charge transfer complex of an organic donor component and iodine into said casing into operative contact with the coated surface of said anode and said cathode current collector.

3,957,534

DIAPHRAGM FOR THE SEPARATION OF HYDROGEN FROM HYDROGEN-CONTAINING GASEOUS MIXTURES

Rolf Linkohr, Stuttgart, and Heinz G. Plust, Neuhausen, both of Germany, assignors to Firma Deutsche Automobilgesellschaft mbH, Germany

Filed Feb. 19, 1974, Ser. No. 443,192

Claims priority, application Germany, Feb. 17, 1973, 2307853

Int. Cl.² H01M 4/86

U.S. Cl. 136—86 D 8 Claims

1. A hydrogen diffusion diaphragm for the selective separation of hydrogen from hydrogen-containing gaseous mixtures, which consists of a shaped body that consists of a nickel-titanium alloy exhibiting a diffusion coefficient of from 10^{-6} to 10^{-5} cm^2/s. at room temperature, said nickel-titanium alloy consisting of Ni and Ti with a molar ratio of Ti to Ni of from 0.8 : 3.2 to 1.1 : 2.9 and said shaped body being formed of a powder of said nickel-titanium alloy pressed under a pressure of from 10 to 15 tons/cm^2 and tempered at a temperature of from 800° to 1,000°C. for a period of from 8 to 10 hours under vacuum.

3,957,535

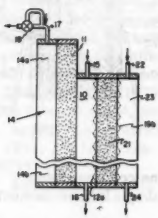
FUEL CELL HEAT AND MASS PLATE

William J. Asher, Panwood, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed July 28, 1971, Ser. No. 166,746

Int. Cl.² H01M 27/00

U.S. Cl. 136—86 E 2 Claims



1. A method for controlling heat and mass inventory in a fuel cell comprising the steps of:

producing product mass at an electrode of said cell;

transporting said product mass to one side of a capillary membrane;

condensing substantially all of said mass on said one side of said capillary membrane;

vaporizing said condensed vapor mass at the other side of said membrane in a vaporization zone;

removing excess vapor from said vaporization zone thereby controlling the mass inventory;

transporting balance of said vapor to a condensation zone;

condensing said vapor in said condensation zone on said capillary membrane thereby rejecting the heat of said vapor to the surroundings; and

returning said condensed vapor through said capillary membrane to again be vaporized thereby removing heat from said reactant plenum.

3,957,536

FUEL CELL

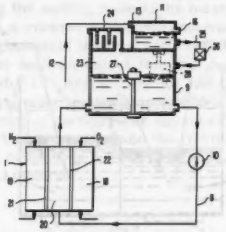
Noriomi Miyoshi, and Michihiko Tsuruoka, both of Kawasaki, Japan, assignors to Fuji Electric Company Ltd., Kawasaki, Japan

Division of Ser. No. 456,993, April 1, 1974, abandoned. This application June 11, 1975, Ser. No. 585,891

Claims priority, application Japan, Mar. 30, 1973, 48-36530

Int. Cl.² H01M 8/04

U.S. Cl. 136—86 R 3 Claims



1. In a fuel cell comprising:

1. a generator cell having a fuel gas chamber, an oxidizing gas chamber, and an electrolyzing solution chamber;

2. a fuel gas circulating circuit for supplying fuel gas to the fuel gas chamber of said generator cell;

3. an oxidizing gas circulating circuit for supplying oxidizing gas to the oxidizing gas chamber of said generator cell;

4. an electrolyte circulating circuit for supplying an electrolytic solution to the electrolyzing solution chamber of said generator cell:

5. a gas cooler located in said fuel gas circulating circuit beneath said generator cell;

6. a formed water tank located beneath said gas cooler and in fluid communication therewith, whereby moisture formed in said generating cell, carried by said fuel gas into said gas cooler, and condensed therein will drip by force of gravity into said formed water tank;

7. an electrolyzing solution tank located in said electrolyte circulating circuit above said generator cell; and

8. a clean water tank located above said electrolyzing solution tank and in fluid communication therewith, whereby clean water can be supplied by force of gravity from time to time to said electrolyzing solution tank from said clean water tank in order to control the concentration of the electrolytic solution therein,

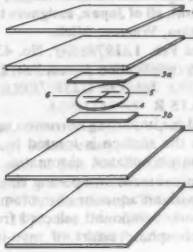
whereby gas leaked into the electrolyzing solution chamber of said generator cell is carried by the electrolytic solution flowing through said electrolyte circulating circuit upwards into said electrolyzing solution tank, where it is easily separated from the electrolytic solution, and electrolytic solution leaked into the fuel gas chamber of said generator cell is carried by the fuel gas flowing through said fuel gas circulating circuit downwards into said gas cooler, where it is separated from the fuel gas and dripped into said formed water tank, the improvement comprising a return pipe connecting said formed water tank to said clean water tank, whereby the formed water can be used for regulating the concentration of the electrolytic solution by setting the inner pressure of said gas cooler at a value such that the formed water rises from said formed water tank through said return pipe to said clean water tank.

3,957,537

MODULES COMPRISING PHOTO-CELLS

Arthur Colin Baskett, Welwyn Garden City, and Peter Michael Riddle, Royston, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sept. 6, 1974, Ser. No. 504,667
Claims priority, application United Kingdom, Sept. 14, 1973, 43276/73
Int. Cl.² H01L 31/04; C03C 27/10
U.S. Cl. 136—89 11 Claims



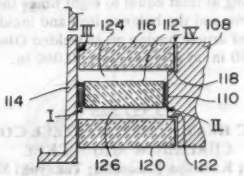
1. A light-responsive module comprising one or more photo-cells encapsulated within a laminate comprising two opposed members adhesively bonded together by means of a hot melt adhesive wherein at least one of the members is transparent and any hot melt adhesive lying between the light-sensitive surface of the photo-cell and a transparent member is itself also transparent, and at least one of the members is sufficiently rigid to enable the module to afford the photo-cell protection against breakage by bending.

3,957,538

ALKALINE BATTERY SEAL

Michael J. Fairweather, Rossland, and John A. Topping, Oakville, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed Feb. 24, 1975, Ser. No. 552,344
Claims priority, application Canada, Feb. 22, 1974, 193272
Int. Cl.² H01M 2/04
U.S. Cl. 136—133 11 Claims



1. In a seal for an alkaline battery, the provision of:

i. a terminal electrode electroplated first with nickel and secondly with chromium,

ii. a steel collar spaced from and surrounding said terminal electrode and provided with an interior shoulder portion,

iii. a ceramic ring located between said terminal electrode and said shoulder portion and having an axial length less than the axial length of said shoulder portion, said ceramic ring being brazed to said shoulder portion in the central region thereof,

iv. a solid glass ring sealing member surrounding said terminal electrode and resting on a ledge of said shoulder portion whereby a void exists between the glass ring and the adjacent surface of the ceramic ring.

3,957,539

BATTERY CELL COVER ASSEMBLY

William B. Hayes, Jr., Cinnaminson, N.J., and Richard L. Kreutzfeldt, Holland, Pa., assignors to Gould Inc., Chicago, Ill.

Filed Feb. 14, 1975, Ser. No. 549,991
Int. Cl.² H01M 2/04
U.S. Cl. 136—170 2 Claims

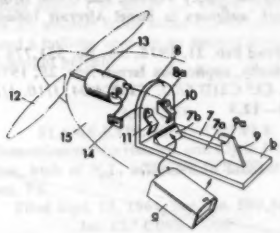
1. In a battery cell cover assembly in which a cover is fitted into the walls of an open-topped jar and a flowable, settable sealant joins the cover and jar, the improvement comprising, a cover having a main planar body and a depending, outwardly sloping, surrounding skirt of substantial depth whose lowest and greatest periphery is well within the opening defined by said walls, said periphery being substantially straight sided, a plurality of sealing strips formed integrally with said skirt with one strip extending down from each straight side of the skirt, said skirt and said strips being formed of resilient material and being joined by straight line, reduced thickness hinge sections, said strips defining jar wall contacting lines and having a relaxed, unstressed position wherein said contacting lines of the sealing strips define a periphery well outside the dimensions of the opening defined by said walls, said strips also having a camming surface for swinging the strips down and in upon insertion of said cover into said jar to thereby form a deep groove for said sealant with a range of groove depth being substantially equal to the depth of said skirt.

3,957,540

BATTERY CASSETTE HOLDER

Kenichi Mabuchi, and Tetsuo Ogita, both of Tokyo, Japan, assignors to Mabuchi Motor Co. Ltd., Tokyo, Japan

Filed Dec. 8, 1971, Ser. No. 205,868
Int. Cl. H01m 1/04
U.S. Cl. 136—173 2 Claims



1. A combination of a battery cassette having, at its front portion, terminals for the anode and the cathode of dry cells juxtaposed therein and, at its rear portion, a releasably fitted lid having a connecting board for connecting said anode and said cathode of the dry cells, said lid defining a projecting flange on the rear portion of the battery cassette when the lid is fitted to the battery cassette; and a holder having a window

for permitting the insertion of the battery cassette therethrough, a base board provided with a projecting bar on which the terminals of the battery cassette rest, a terminal mounting board provided with a pair of resilient terminals for making contact with the terminals of the battery cassette and a fixing board having a notch for engagement with an upper side of said projecting flange of the battery cassette.

3,957,541

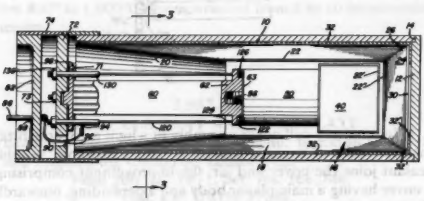
IMPLANTABLE THERMOELECTRIC GENERATOR HAVING THERMOPILE COMPRESSION WIRES

Thomas Stratton Bustard, Ellicott City, and David Earl Goslee, White Marsh, both of Md., assignors to Nuclear Battery Corporation, Columbia, Md.

Continuation of Ser. No. 189,839, Oct. 18, 1971, abandoned. This application Mar. 4, 1974, Ser. No. 448,023

Int. Cl.² H01L *35/02*

U.S. Cl. 136—205 **4 Claims**



1. In a thermoelectric generator of the type implantable in the human body, including a vacuum tight outer casing containing an insulation system lining the interior space of the outer casing and a fuel capsule and an elongated thermopile having hot and cold end plates located within the casing inside the insulation system, the improvement comprising harness means for maintaining a compressive load on said thermopile comprising a plurality of thin tension wires, each attached at one end to the hot end plate of said thermopile and at the other end to said cold plate, each said tension wire being tensioned to impose a compressive load on said thermopile and each having a strength to conductivity ratio of greater than 250,000 $(lb_f\text{-hr-}°F)/(BTU\text{-in})$ for providing the highest possible compressive strength for the lowest possible thermal conductivity to minimize the amount of heat by-passing said thermopile.

3,957,542

HEAT TREATMENT METHOD FOR EXTENDING THE SECONDARY CREEP LIFE OF ALLOYS

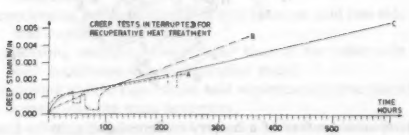
Baruch Cina, Ramat Gan; Michael Meron, Tel Aviv; Stuart Maurice Myron, Ganey Yehuda, and Gidon Dror, Tel Aviv, all of Israel, assignors to Israel Aircraft Industries, Ltd., Israel

Filed Feb. 21, 1975, Ser. No. 551,776

Claims priority, application Israel, Nov. 25, 1974, 46114

Int. Cl.² C21D *6/02*; C22F *1/04*, *1/10*, *1/18*

U.S. Cl. 148—12.3 **11 Claims**



1. A method of extending the secondary creep life of a part of an alloy which alloy had previously been subjected to a solution heat treatment at a high temperature and to a subsequent precipitation hardening heat treatment at a lower temperature, characterized in subjecting the part, after it has experienced significant secondary creep because of sustained stress at an elevated service temperature but before tertiary creep has set in, to a recuperative heat treatment at a temperature substantially below the solution heat treatment temperature while the part is unstressed.

3,957,543

METHOD FOR RINSING A CONVERSION COATED METAL SURFACE

Hiroshi Shinomiya, Yokohama; Kakuro Muro, Komae; Akimitsu Fukuda, Kawasaki; Yoshio Nagae, Tokyo, and Yoshiji Shirogane, Zushi, all of Japan, assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Feb. 1, 1974, Ser. No. 438,935

Claims priority, application Japan, Feb. 12, 1973, 48-16538

Int. Cl.² C23F *7/08*

U.S. Cl. 148—6.15 R **6 Claims**

1. In a method for imparting corrosion resistance to a metal surface wherein the surface is treated to form a conversion coating based on phosphates, chromates, oxalates or oxides thereon, the improvement comprising rinsing the conversion coated surface with an aqueous chromium-free solution containing at least one compound selected from the group consisting of the phosphate esters of myo-inositol having the formula:

$$C_6H_n(OH)_n[OPO(OH)_2]_m$$

wherein $m = 2$ to 6 and $n = 6-m$ and the water soluble salts thereof in a concentration of at least 0.05 g/l, said aqueous solution having a pH of from 2 to 12.

3,957,544

FERRITIC STAINLESS STEELS

Kenneth E. Pinnow, and Jerome P. Bressanelli, both of Pittsburgh, Pa., assignors to Crucible Inc., Pittsburgh, Pa.

Division of Ser. No. 233,441, March 10, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,700

Int. Cl.² C22C *38/26*, *38/28*

U.S. Cl. 148—34 **6 Claims**

1. A fully ferritic stainless steel welded article with high resistance to chloride stress corrosion, especially in the cold-worked condition, and high resistance to intergranular corrosion in combination with good weld formability, said entire welded articl consisting essentially of, in weight percent, 0.003 to 0.04 carbon; 0.003 to 0.04 nitrogen content being below 0.04; up to 1.0 manganese; up to 1.0 silicon; 23.0 to 28.0 chromium; up to 0.50 nickel; up to 0.50 copper, the sum of the nickel and cooper content being below 0.050; up to 0.20 cobalt; up to 2.75 molybdenum; 0.05 to 0.70 columbium, with columbium being at least equal to eight times the carbon plus nitrogen content; and the balance iron and incidental impurities, said welded article having an as-welded Olsen cup height exceeding 0.250 in. at a thickness of 0.060 in.

3,957,545

AUSTENITIC HEAT RESISTING STEEL CONTAINING CHROMIUM AND NICKEL

Tohru Mimino; Kazuhisa Kinoshita; Takayuki Shinoda; Syuji Oki, and Akira Nagao, all of Kawasaki, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 58,895, July 28, 1970, abandoned, which is a continuation-in-part of Ser. No. 699,388, Jan. 22, 1968, abandoned. This application Feb. 1, 1973, Ser. No. 328,694

Int. Cl.² C22C *38/48*, *38/50*

U.S. Cl. 148—38 **2 Claims**

1. In an austenitic heat resistant steel which has been subjected to solution heat treatment at a temperature of at least 1050°C. in a final step, the improvement which comprises a steel consisting of, in weight percent:

C	0.03 – 0.20
Cr	15.5 – 21.0
Ni	7.0 – 14.0
Nb or Nb ± Ta	0.005 – 0.30
Si	less than 1.00
Mn	less than 2.00
Ti	less than 0.10
Fe and unavoidable impurities	balance

Nb/C < 3.5,

said steel having been subjected to a solution temperature of from 1050°C. for at least 30 minutes or from 1100°C. for at least 5 minutes, to 1300°C., thereby having an austenitic crystal grain size, ASTM, within the range of from No. 3 to No. 8.

3,957,546

METHOD OF PRODUCING ORIENTED SILICON-IRON SHEET MATERIAL WITH BORON AND NITROGEN ADDITIONS

Howard C. Fiedler, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 506,545, Sept. 16, 1974, abandoned, which is a continuation-in-part of Ser. No. 320,668, Jan. 2, 1973, abandoned. This application June 9, 1975, Ser. No. 585,093

Int. Cl.² H01F *1/04*

U.S. Cl. 148—111 **10 Claims**

1. The method of producing grain-oriented silicon-iron sheet which comprises the steps of providing a silicon-iron melt containing 2.2 to 4.5 per cent silicon, amounts of manganese and sulfur within a ratio of manganese to sulfur less than 1.8, between about three and 35 parts per million of boron, and between about 30 and 70 parts per million nitrogen in the ratio to boron of one to 15 parts per part of boron, casting the melt to form an ingot, hot rolling the ingot to produce an elongated sheet-like body, heat treating the said hot-rolled body to effect at least partial recrystallization, cold rolling the said hot-rolled body and reducing its thickness to final gauge thickness without reheating the cold-worked sheet, and thereater subjecting the cold-worked sheet to a final heat treatment to decarburize it and to develop (110) [001] secondary recrystallization texture in it.

3,957,547

METHOD FOR DOPING SEMICONDUCTORS IN CENTRIFUGE

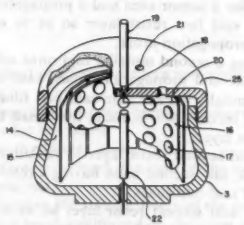
Paul Schmider, Munich-Oberfoehring, Germany, assignor to Beckman Instruments G.m.b.H., Munich, Germany

Filed Apr. 8, 1974, Ser. No. 458,972

Claims priority, application Germany, Apr. 17, 1973, 2319481

Int. Cl.² H01L *21/225*

U.S. Cl. 148—186 **15 Claims**



1. A method of incorporating an impurity substance in a solid state basic material by doping or alloying semiconductor basic material with impurity substance in the form of atoms, molecules or ions wherein the improvement comprises subjecting the impurity substance to be incorporated to high gravitational acceleration acting against the solid state basic material whereby incorporation of the impurity substance into the solid state basic material is accomplished by solid state sedimentation.

3,957,548

PROPELLING CHARGE COMPOSITION FOR EFFICIENCY INCREASED AMMUNITION

Horst Rohr, Trechtingshausen, and Karl-Otto Wehlow, Hargesheim, both of Germany, assignors to Firma Josef Schaberger & Co. GmbH, Germany

Filed Mar. 19, 1974, Ser. No. 452,581

Claims priority, application Germany, Mar. 20, 1973, 2313856

Int. Cl.² C06B *45/28*

U.S. Cl. 149—10 **5 Claims**

1. Propelling charge composition consisting of a mixture of two powder components, respectively powder types (1) and (2) of different burning time whereby the quicker burning powder component, respectively powder type (2) is retarded in its initial combustion by means of a protective coating of gelatine or gelatine-gum arabic wherein said coating does not stick tightly on the enveloped powder grain; wherein the slowly burning component (1) has a nitroglycerine content of about 10% and is a ball powder and the quicker burning component respective powder type (2) is a nitrocellulose-nitroglycerine powder of about 10% nitroglycerine.

3,957,549

LOW SIGNATURE PROPELLANTS BASED ON ACRYLIC PREPOLYMER BINDER

Mart G. Baldwin, Newtown, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 14, 1974, Ser. No. 479,401

Int. Cl.² C06B *45/10*

U.S. Cl. 149—19.91 **3 Claims**

1. A solid propellant composition that yields a high specific impulse and exhaust products that are substantially smokeless and with a low-signature, said propellant composition consisting essentially of: a prepolymer binder formulated of about 90–95 parts of an acrylate selected from petrin acrylate and 2,2′ dinitropropyl acrylate and acrylic acid from about 5–10 parts, said binder employed in said composition in amounts from about 15–20 weight percent; a plasticizer selected from butanetriol trinitrate, glyceryl trinitrate, and the mixed plasticizers of triethyleneglycol dinitrate (TEGDN) and trimethylolpropane trinitrate (TMETN) in amounts from about 25–30 weight percent, said mixed plasticizers being in ratio of about 1 part TEGDN with 2 parts of TMETN; a solid oxidizer selected from cyclotetramethylenetetranitramine, cyclotrimethylenetrinitramine, and ammonium nitrate in amounts from about 50–60 weight percent; a crosslinking agent in an amount from about 1 to about 2.5 weight percent; a curing catalyst in an amount from about 0.1 to about 0.3 weight percent; and a ballistic agent in an amount from about 0.5 to about 1.5 weight percent.

3,957,550

FLAME-EXPLOSION COUPLE

Stanley Tannenbaum, Morristown, and Clyde J. Poulin, Mount Arlington, both of N.J., assignors to Thiokol Corporation, Newtown, Pa.

Filed Sept. 13, 1966, Ser. No. 580,562

Int. Cl.² C06B *35/00*

U.S. Cl. 149—35 **10 Claims**

1. A flame-explosion couple comprising an intimate mixture of a major amount of a volatile liquid fuel, a minor but substantial amount of a component which is a secondary explosive selected from the group consisting of hydrazine, ammonium perchlorate, ammonium nitrate, dinitrotoluene, trinitrotoluene, nitromethane, tetranitromethane, trinitrophenylmethylnitramine, cyclotrimethylenetrinitramine, pentaerythritol

tetranitrate, picric acid, ammonium picrate and ethylenediaminedinitrate or a strong oxidizer selected from the group consisting of sodium, ptassium, lithium and ammonium perchlorates and sodium nitrate and a small amount of a primary explosive selected from the group consisting of lead azide, mercury fulminate, lead styphnate, diazodinitrophenol and nitromannite.

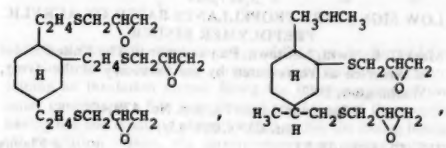
3,957,551

PROPELLANT COMPOSITIONS HAVING CARBOXYL CONTAINING BINDER CURED WITH A GLYCIDYL THIOETHER

Harold E. Filter, Midland, and Don L. Stevens, Sanford, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 17, 1971, Ser. No. 209,441
Int. Cl.[2] C06D 5/06
U.S. Cl. 149—19.5 **9 Claims**

1. A solid propellant composition in the form of a cured grain which comprises an inorganic chlorate, nitrate or perchlorate as oxidizer in intimate combination with the reaction product of a carboxyl containing polyisoprene, polyester, polyglycol or polybutadiene with a glycidyl thioether selected from the group consisting of



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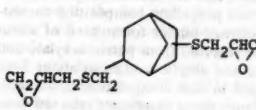

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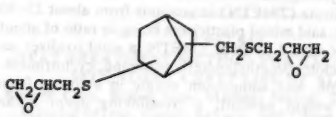
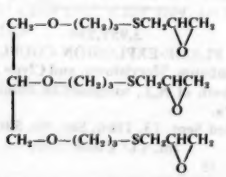


or



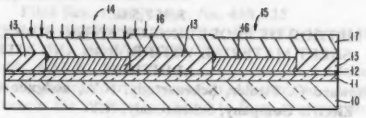
said composition being further described in that it is prepared by mixing the oxidizer, carboxyl containing polymer and glycidyl thioether, wherein the organics are present in amounts sufficient to provide an epoxide to carboxyl equivalent ratio of from 0.5/1 to 2.25/1, with subsequent curing the resulting mixture to a coherent grain.

3,957,552

METHOD FOR MAKING MULTILAYER DEVICES USING ONLY A SINGLE CRITICAL MASKING STEP

Kie Y. Ahn, Chappaqua; Michael Hatzakis, Ossining, and John V. Powers, Shenorock, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 5, 1975, Ser. No. 555,645
Int. Cl.[2] C23F 1/04
U.S. Cl. 156—11 **14 Claims**



1. A method for selectively metallizing a microelectronic device, comprising the steps of:

a. depositing a first metallic film on said device;
b. coating said device with a first resist layer;
c. exposing and developing said first resist layer so as to uncover said first film in predetermined first and second areas of said device;
d. depositing a second metallic film in said first and second areas;
e. coating said device with a second resist layer;
f. exposing and developing said second resist layer so as to expose said first area and to protect said second area from subsequent deposition;
g. depositing a third metallic film onto said second film in said first area, said second area being protected during deposition of said third metallic film;
h. removing said resist layers, thereby uncovering those portions of said first film not in said first or second areas; and
i. removing said portions of said first film.

10. A method for fabricating a magnetic bubble domain device having a continuous layer of material capable of supporting magnetic bubble domains therein, said method comprising the steps of:

a. depositing a first metallic film over said layer;
b. coating said first film with a first resist layer;
c. exposing said first resist layer to radiation through a first mask to define a sensor area and a propagation area;
d. developing said first resist layer so as to expose said sensor and propagation areas;
e. electroplating a second metallic film onto said first film in said sensor and propagation areas, said second film being substantially thicker than said first film;
f. coating said second film and said first resist layer with a second resist layer;
g. exposing said second resist layer to radiation through a second mask, said second mask having a resolution lower than that of said first mask;
h. developing said second resist layer so as to leave said second resist layer on said sensor area;
i. electroplating a third metallic film on said second film in said propagation area, said third film being substantially thicker than said first film;
j. dissolving said first and second resist layers so as to expose a portion of said first film; and
k. etching said first, second and third films until said portion of said first film has been removed.

3,957,553

NON-CHROMATED ALKALINE ETCHING BATH AND ETCHING PROCESS FOR ALUMINUM

Harold Vernon Smith, Philadelphia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 278,891, Aug. 9, 1972, Pat. No. 3,802,973. This application Mar. 1, 1974, Ser. No. 447,430

Int. Cl.² C23F 1/00

U.S. Cl. 156—22 9 Claims

1. The composition for etching aluminum and aluminum alloys comprised of an aqueous solution of

alkali metal hydroxide — 15 to about 200 grams/liter,

at least one chelating agent — 0.5 to about 15 grams/liter, and

at least one oxidizing agent — 0.0001 to about 1 gram/liter.

4. The process for etching aluminum and aluminum alloys comprising contacting the said aluminum with an aqueous solution of

alkali metal hydroxide — 15 to about 200 grams/liter,

at least one chelating agent — 0.5 to about 15 grams/liter, and

at least one oxidizing agent — 0.0001 to about 1 gram/liter for 1 to 15 minutes at a temperature within the range of 120° to 190°F.

3,957,554

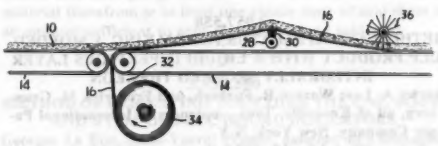
ATTACHMENT OF NET TO NON-WOVEN BLANKET WITHOUT ADHESIVE

George Holger Sundin, Duluth, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Continuation-in-part of Ser. No. 363,510, May 24, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 535,279

Int. Cl.² B32B 31/00, 5/02

U.S. Cl. 156—62.6 6 Claims



1. A method of affixing net to a non-woven blanket of fibers comprising:

a. forming a non-woven blanket comprising fibers and a binder for the fibers;

b. before the binder is set,

i. contacting at least one side of the said blanket with a plastic net;

ii. disrupting the surface fibers of the non-woven blanket with a brush positioned on the same side of the blanket as the net to cause at least some of the surface fibers to overlap at least some of the strands of the net;

c. setting the binder to cause the fibers to assume a fixed position whereby the net is affixed to the blanket due to the fixed position of the fibers which overlap strands of the net and without adhesive bond between the blanket fibers and the strands of the net.

3,957,555

METHOD OF MAKING PILE FABRIC HAVING AN ADHESIVE SUBSTRATE

Emanuele Bondi, Milan, Italy, assignor to Fieldcrest Mills, Inc., Eden, N.C.

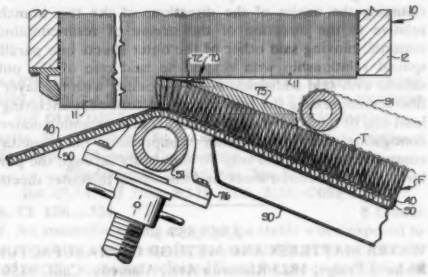
Continuation-in-part of Ser. No. 363,832, May 25, 1973, Pat. No. 3,847,692, which is a continuation-in-part of Ser. No. 54,751, July 14, 1970, abandoned. This application July 22, 1974, Ser. No. 490,227

Claims priority, application Italy, July 24, 1969, 20100/69; Dec. 12, 1969, 25744/69

The portion of the term of this patent subsequent to Nov. 12, 1991, has been disclaimed.

Int. Cl.² B32B 5/00, 31/12, 31/18

U.S. Cl. 156—72 11 Claims



1. A method of making pile fabrics, such as carpets, rugs and the like, which comprises providing a pile strand block of substantially parallel strands of pile forming material in an open-ended container, incrementally feeding from the container the pile strand block parallel to the axes of the pile strands in successive increments of an amount equal to the desired length of pile, forming a substrate by depositing a layer of adhesive onto a release surface, severing each successive fed increment of pile strands transversely of the pile strand axes to form a pile slice while bringing the severed pile slice into contact with the layer of adhesive for securement thereto and to form cut pile tufts thereon, and then separating from the release surface the substrate with the cut pile tufts thereon.

3,957,556

METHOD FOR PRODUCING SHEET MOLDING COMPOSITE

Edward L. Wilson, Newark; John J. McCluskey, Granville, both of Ohio; Ronald Z. Bell, Huntsville, Ala.; Richard T. Linak, Jackson, Tenn., and Gordon P. Armstrong, Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 215,770, Jan. 6, 1972, Pat. No. 3,861,982. This application July 22, 1974, Ser. No. 490,596

Int. Cl.² B32B 31/06

U.S. Cl. 156—87 3 Claims

1. A method of producing a moldable sheet material comprising a pair of outer sheets with glass fiber-reinforced resin-containing material therebetween, said method comprising preparing a single supply of resin-containing material, forming a single downwardly directed stream of the resin-containing

material, intercepting the stream and dividing the stream into only two branches, directing the branches in directions transverse to the direction of movement of the stream, subsequently applying one of the branches of the stream of resin-containing material to one of the outer sheets to form a layer of the resin-containing material on the one of the outer sheets, applying randomly disposed, glass fibers onto said layer of resin-containing material, subsequently applying the other of the branches of the stream of resin-containing material to the other of the outer sheets to form an additional layer of resin-containing material on the other of the outer sheets, sensing the thickness of the resin-containing material already on at least one of said sheets, changing the proportional amounts of the resin-containing material in the two branches delivered to the outer sheets in accordance with the thickness of the resin-containing material already on at least one of the sheets by changing the angles of the directions of the two branches relative to the direction of the stream of resin-containing material, moving said other of the outer sheets into parallel, spaced relationship with respect to said one of the outer sheets, with said additional layer in contact with the layer of fibers, compressing the composite thus formed, puncturing at least one of the outer sheets and the resin-containing material contiguous therewith, further compressing the punctured composite to force and trap air outwardly through the punctures in the punctured sheet, and smoothing the outer sheets.

3,957,557

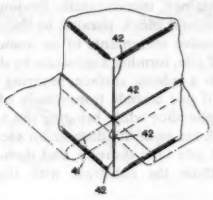
WATER MATTRESS AND METHOD OF MANUFACTURE

Richard Fraige, 1823 Alameda Ave., Alameda, Calif. 94501

Filed Apr. 10, 1975, Ser. No. 566,858

Int. Cl.² B31F *3/00*

U.S. Cl. 156—211 **10 Claims**



1. A method of manufacturing a water mattress from a rectangular sheet of a flexible thermal plastic-like sheet material which comprises the steps of:

incorporating in such a flat rectangular sheet of thermal plastic an ingress-egress valve having a central aperture therein;

folding said rectangular sheet of thermal plastic on itself to form connected top and bottom smaller rectangular sheets in juxtaposition with each other having three open sides with lapped raw edges and a fourth common side formed by the folded edge;

separately sealing each of said open sides composed of the lapped raw edges by bonding its raw edge of the top sheet to its corresponding raw edge of the bottom sheet with a lapped seam formed simultaneously along its entire side while holding said edges in a contiguous parallel aligned relationship;

notching each of the four corners of the resulting flat envelope to form an angular L-shaped cut-out corner of a predetermined size and configuration;

thereafter, separately sealing each of the resulting notched corners by separating the apex of its notch in the top sheet from the corresponding apex of its notch in the bottom sheet to form an elongated slit;

stretching such slit so formed longitudinally over an oval elongated die sufficient to bring the edges of said slit into an overlapping relationship with one another; and

sealing the overlapping edges of such slit by bonding them with one another while stretched over such die.

9. A method of manufacturing a water mattress using heat sealing techniques from a single piece of rectangular flexible sheet material susceptible to heat sealing without adhesives comprising the steps of:

folding a sheet of thermal plastic material having an appropriate rectangular configuration into an overlapping arrangement with equal top and bottom rectangular portions joined by the resulting fold line with the resulting peripheral edges of said top portion in registry with the peripheral edges of said bottom portion, forming three aligned pairs of edges;

separately sealing each of said aligned pairs of edges to form a rectangular envelope by:

i. inserting a portion of said sheet material adjacent to a first edge of said pair of edges into a holding die along the entire length of said first edge so that it passes behind a backing member in said holding die and so that it is parallel with a surface of said backing member to expose a rectangular flap portion of a substantially uniform width next to said backing member;

ii. positioning the other edge of said pair of edges in said holding die so it is parallel with said first edge with its contiguous sheet portion in a proximate lapped relationship with said rectangular flap portion;

iii. positioning said rectangular flap portion in a lapped relationship with said contiguous portion of said other edge so a lap of a substantially uniform width is formed by a physical engagement of an inner surface and an outer surface respectively of said top and bottom portions adjacent to said pair of edges;

iv. clamping at least a longitudinal portion of the resulting lap in the holding die and against a surface of said backing member;

v. engaging said resulting longitudinal lap with a heat welding member along its entire length;

vi. simultaneously heat bonding a longitudinal portion of said resulting lap between said pair of edges along the entire length of said resulting lap;

unclamping said holding die to release the resulting lap from said die;

removing said backing member; and

subsequently closing the corners of said envelope to form the water mattress.

3,957,558

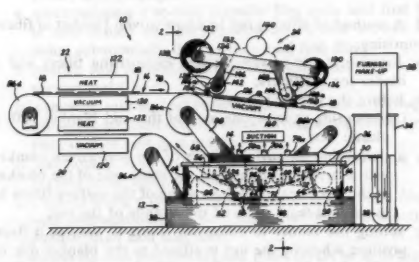
METHOD AND APPARATUS FOR MAKING A MOLDED PULP PRODUCT WITH A LIQUID IMPERVIOUS LAYER INTEGRALLY SECURED THEREON

Charles A. Lee; Warren R. Furbeck, and Frederick M. Granberg, all of Knoxville, Tenn., assignors to International Paper Company, New York, N.Y.

Filed Apr. 19, 1974, Ser. No. 462,257

Int. Cl.² B29C *17/04*; B32B *31/08*; B30B *15/34*; B32B *5/16*

U.S. Cl. 156—212 **8 Claims**



1. A method for applying a layer of liquid impervious thermoplastic material to an exposed surface area of a molded

pulp product formed on and carried by a mold movable along a predetermined path, said mold including a foraminous base portion upon which said pulp product is formed and having a cutting edge extending around the full periphery of the pulp product formed on said base portion, said cutting edge projecting above the uppermost surface of said base portion, when considered with the mold in an upright position; said method comprising the steps of creating a run of said thermoplastic material between a let-off roll and a take-up roll along a path substantially parallel to said path traveled by said mold, heating said mold and the associated cutting edge and pulp product carried thereon to a temperature such that the latent heat of said cutting edge and pulp product is at least equal to the softening temperature of said impervious material after said heating, causing said impervious material to engage said cutting edge during movement along said run while the latent heat of said cutting edge is at least equal to the softening temperature of said thermoplastic material, subjecting the side of said pulp product opposite its exposed surface to suction simultaneously with said engagement of said impervious material with said cutting edge so that said thermoplastic material is severed by said cutting edge along the line of contact therewith to establish a severed portion of said material without moving said cutting edge toward said material, said severed portion of material being sufficient to cover the exposed surface of the pulp product carried by said mold, and heat bonding said severed portion to said pulp product by causing said severed portion to be drawn against said heated exposed surface of said pulp product by said suction.

3,957,559

CHEMICALLY FILLED POLYMERIC ARTICLES

Henry Tice Hoffman, Jr., Trenton, N.J., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 253,775, May 16, 1972, Pat. No. 3,849,168, which is a continuation-in-part of Ser. No. 868,626, Oct. 22, 1969, abandoned. This application July 8, 1974, Ser. No. 486,563

Int. Cl.² B32B *31/18*

U.S. Cl. 156—254 **8 Claims**

1. A process for splitting solid gas-permeable polyethylene sheets comprising contacting at least one surface of said polymeric sheet with at least one diffusion compound in the gaseous state for a period of time sufficient to diffuse said compound into said gas-permeable sheet and deposit immobile material therefrom in at least one planar zone of said sheet in an amount sufficient to split said sheet along said zone.

3,957,560

METHOD OF CEMENTING TOGETHER THE CAP, BODY, AND STEM OF ELECTRICAL INSULATORS

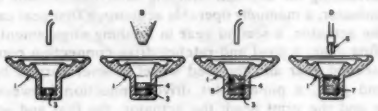
Georges Le Bon, Saint-Yorre, France, assignor to Compagnie General d'Electro Ceramique — Ceraver, France

Filed July 22, 1970, Ser. No. 57,060

Claims priority, application France, July 25, 1969, 69.25573

Int. Cl.² B29C *19/00*

U.S. Cl. 156—293 **9 Claims**



1. The method of cementing a hollow cap of an electrical insulator, to and exteriorly about the body portion of the insulator, comprising, adding measured quantities of water and cement into the cap, mixing the water and cement into mortar within the cap, and bringing the cap and body portion into final assembled relation with the body portion within the mortar.

3,957,561

ANAEROBIC ADHESIVE AND SEALANT COMPOSITIONS EMPLOYING A TWO COMPONENT CATALYST SYSTEM OF DIAZOSULFONE AND O-SULFOBENZIMIDE

Martin M. Skoultchi, Somerset, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

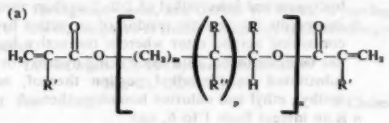
Filed May 22, 1975, Ser. No. 579,781

Int. Cl.² C09J *5/00*; B32B *7/00*, *7/10*; C08F *3/64*

U.S. Cl. 156—331 **8 Claims**

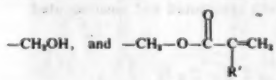
1. An anaerobic curing composition stable when exposed to air comprising a mixture of a polymerizable acrylic or substituted acrylic monomer selected from the group consisting of

(a)



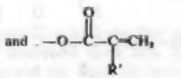
wherein

R is selected from the group consisting of hydrogen, methyl, ethyl,



R′ is selected from the group consisting of hydrogen, chlorine, methyl and ethyl;

R″ is selected from the group consisting of hydrogen, hydroxy,

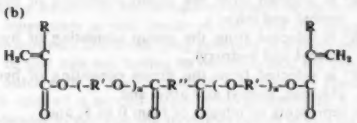


m is an integer from 1 to 8; and

n is an integer from 1 to 20; and

p is 0 or 1;

(b)

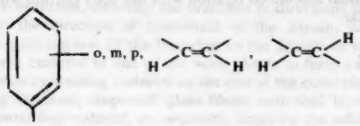


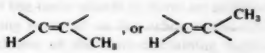
wherein

R represents hydrogen, chlorine, methyl or ethyl,

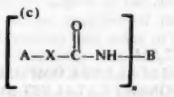
R′ represents alkylene with 2–6 carbon atoms,

R″ represents $(CH_2)_m$ in which *m* is an integer of from 0 to 8,





and *n* represents an integer of from 1 to 4;



wherein

X is selected from the group consisting of —O— and

and

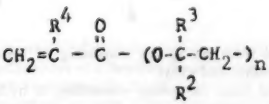
R is a member selected from the group consisting of hydrogen and lower alkyl of 1 to 7 carbon atoms,

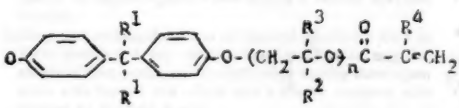
A represents the organic residue of an active hydrogen containing acrylic ester wherein the active hydrogen has been removed, said ester being hydroxy or amino substituted on the alkyl portion thereof, and the methyl, ethyl and chlorine homologs thereof,

n is an integer from 1 to 6, and

B is a mono- or polyvalent organic radical selected from the group consisting of alkyl, alkylene, alkenyl, cycloalkyl, cycloalkylene, aryl, aralkyl, alkaryl, poly(oxyalkylene), poly(carboalkoxyalkylene), and heterocyclic radicals both substituted and unsubstituted;

(d)





wherein

R^1 is selected from the group consisting of methyl, ethyl, carboxyl and hydrogen,

R^2 is selected from the group consisting of hydrogen, methyl and ethyl;

R^3 is selected from the group consisting of hydrogen, methyl and hydroxyl;

R^4 is selected from the group consisting of hydrogen, chlorine, methyl and ethyl and

n represents an integer of from 0 to 8; and

e. monofunctional acrylate and methacrylate esters and the hydroxy, amide, cyano, chloro, and silane substituted derivatives thereof; and from 0.05 to 4%, by weight of monomer, of a diazosulfone and from 0.05 to 4%, by weight of monomer, of ortho-sulfobenzimide, the latter compounds present in amount sufficient to initiate polymerization of said acrylic monomer at room temperature in the absence of air or oxygen and on contact with an active metal surface.

7. A method of adhering closely facing surfaces, at least one being an active metal surface, which comprises interposing between said surfaces the composition of claim 1 and permitting said composition to cure in the absence of air or oxygen until said composition is set.

3,957,562

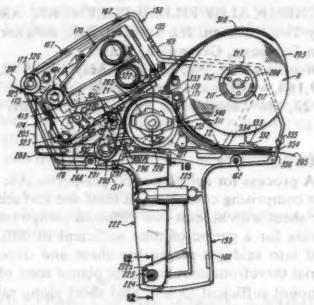
APPARATUS FOR PRINTING AND APPLYING PRESSURE SENSITIVE LABELS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 380,445, July 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 312,454, Dec. 6, 1972, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application June 5, 1974, Ser. No. 476,744

Int. Cl.² B32B *31/00*

U.S. Cl. 156—384 **34 Claims**



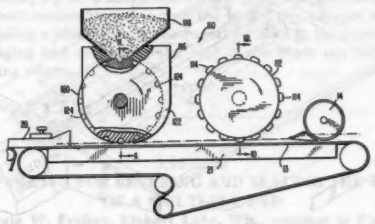
1. Apparatus for printing and applying pressure-sensitive labels carried on a web of supporting material, comprising: a platen, a print head, track structure mounting the print head for reciprocating movement into and out of printing cooperation with the platen, a delaminator for delaminating printed labels from the supporting material web, an applicator for applying printed labels, a feed wheel engageable with the web for advancing the web and effecting label delamination at the delaminator, a manually operable actuator, a first gear carried by the actuator, a second gear in meshing engagement with the first gear, a pawl and ratchet drive connection coupling the second gear and the feed wheel, a lever carried by the second gear, a pin-and-slot drive connection between the lever and the print head; the actuator, the first and second gears, the lever, and the print head having initial positions; whereby when the actuator is operated the first gear drives the second gear and the lever to drive the print head into printing cooperation with the platen, and return spring means for returning the actuator, the first and second gears, the lever and the print head to their initial positions and for driving the feed wheel through the drive connection.

3,957,563

METHOD AND APPARATUS FOR THE MANUFACTURE OF FILTER RODS CONTAINING PARTICULATE MATERIAL BY A SPLIT ROD TECHNIQUE

John H. Sexstone, Middletown, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Division of Ser. No. 445,311, Feb. 22, 1974, Pat. No. 3,884,741. This application May 15, 1975, Ser. No. 577,896
Int. Cl.² A24C 5/50
U.S. Cl. 156—438 11 Claims



1. An apparatus for manufacturing tobacco smoke filters comprising:

a. means for conveying preformed a rod of filtering material having a longitudinal axis,

b. means for cutting said rod in the direction of said axis,

c. means for spreading apart the cut rod to expose the interior of said rod,

d. means for providing pockets at axially spaced positions in the interior of said rod prior to depositing particulate material.

e. means for depositing particulate materials in said pockets,

f. means for closing the rod about said particulate material, and

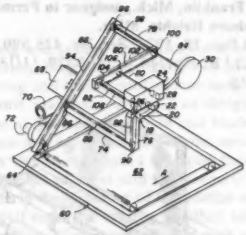
g. means for sealing the rod,

3,957,564

APPARATUS FOR WATER TIGHT SEAMING OF FLEXIBLE THERMOPLASTIC SHEET MATERIAL

Everette M. Lambert, Littleton, and Richard L. Ball, Denver, both of Colo., assignors to Drake, Crandell & Batchelder, Fort Collins, Colo.

Division of Ser. No. 286,181, Sept. 5, 1972, Pat. No. 3,869,327. This application Nov. 1, 1974, Ser. No. 519,782
Int. Cl.² A47C 31/00; B32B 31/60
U.S. Cl. 156—497 8 Claims



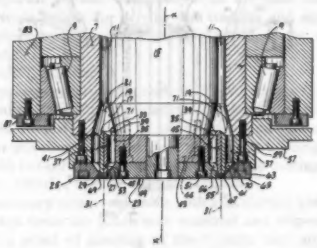
1. Apparatus for thermally bonding an elongate reinforcing strip of flexible material to an envelope of flexible plastic material in overlying relationship with a previously formed first peripheral seam of said envelope to form a reinforced peripheral seam, said apparatus comprising a frame, a first stationary head assembly, said frame including a stationary frame member mounting said stationary head assembly and adapted to extend through a slit in said envelope spaced from said first seam for supporting said first head assembly within the interior of the envelope, a second head assembly, said frame including a moveable frame section supporting said second head assembly for movement between an operative position closely adjacent said first head assembly and an inoperative position spaced from said first head assembly to accommodate placement and removal of the envelope on said first head, cooperating opposed drive roll means on said first and second head assemblies operable when said secnd head assembly is in said operative position to grippingly engage the envelope received on said first head assembly and to feed the envelope between said head assemblies longitudinally along said first seam, reel means mounted on said frame supporting a supply of said strip, said drive roll means being operable when said second head assembly is in said operative position to withdraw said strip from said reel means and press said strip against the envelope in overlying relationship to said first seam as the envelope is fed between said head assemblies, and a heat gun mounted in said second head assembly for directing a blast of hot air against said envelope at a point immediately preceding the contact between said strip and the envelope for maintaining a predetermined temperature in the region where the envelope and strip move into contact with each other sufficient to cause said strip to be thermally bonded to the envelope as said strip is pressed against the envelope by said drive roll means.

3,957,565

APPARATUS FOR EXTRUDING PLASTIC NETTING

Wayne W. Livingston, Osseo, and Gerald W. Melin, Wyoming, both of Minn., assignors to Bemis Company, Inc., Minneapolis, Minn.

Filed Mar. 13, 1974, Ser. No. 450,859
Int. Cl.² B29B 5/04
U.S. Cl. 156—500 8 Claims



1. Apparatus for extruding plastic netting comprised concentric inner and outer dies, the outer die having a central opening and the inner die having a rotary sealing fit in said opening, the inner die being rotatable in one direction and the outer die being rotatable in the opposite direction about a common die axis, each die having a circular series of extrusion passages for extrusion of filaments of plastic therethrough from one side of the die constituting its inside to the other side constituting its outside, the extrusion passages of the inner die having inner ends at said inside of the inner die spaced at intervals around a first circle lying generally in a plane perpendicular to said axis and having its center in said die axis, and having outer ends at said outside of the inner die spaced at intervals around a second circle lying generally in a plane perpendicular to said axis and having its center in said die axis, said second circle being larger than said first circle and said circles thereby defining a frustum of a first cone diverging in the direction toward the outside of the inner die, the extrusion passages of the outer die having inner ends at said inside of the inner die spaced at intervals around a third circle lying generally in a plane perpendicular to said axis and having its center

in said die axis, and having outer ends at said outside of the inner die spaced at intervals around a fourth circle lying generally in a plane perpendicular to said axis and having its center in said die axis, said fourth circle being smaller than said third circle and said third and fourth circles thereby defining a frustum of a second cone converging in the direction toward the outside of the outer die, the extrusion passages of the inner die extending from said first circle to said second circle and thereby being angled outwardly away from said die axis, and also being inclined in one direction relative to the generatrices of said first cone and the extrusion passages of the outer die extending from said third circle to said fourth circle and thereby being angled inwardly toward said die axis, and also being inclined in the opposite direction relative to the generatrices of said second cone.

3,957,566

APPARATUS FOR MAKING LAMINATED THERMOPLASTIC FILM

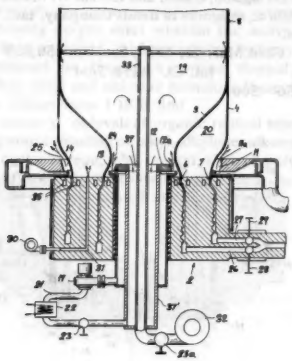
Herbert Rahlfs, Troisdorf-Sieglar, Germany, assignor to Reifenhauser KG, Troisdorf, Germany

Filed Dec. 3, 1973, Ser. No. 421,493

Claims priority, application Germany, Dec. 2, 1972, 2259089

Int. Cl.² B29F *3/08*

U.S. Cl. 156—500 **7 Claims**



1. An apparatus for making laminated thermoplastic film, comprising:

an extrusion head provided with a plurality of concentric annular orifices centered on a common axis for extruding several thermoplastic tubes in nested relationship;

blowing means forming an axially diverging first annular nozzle adjacent a face of said head concentrically surrounding the outermost orifice and an axially converging second annular nozzle adjacent said face concentrically surrounded by the innermost orifice for training respective streams of cooling air in the general direction of extrusion along the outer surface of the outermost tube and along the inner surface of the innermost tube emerging from said orifices with creation of sufficient air pressure in said innermost tube to bring the tubes into adhesive contact with one another whereby a laminate is formed; and

pressure means downstream of said head for flattening said laminate.

3,957,567

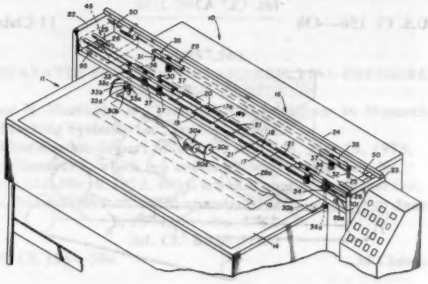
SPLICING APPARATUS

Jarsel M. Pursell, and George N. Willman, both of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 6, 1974, Ser. No. 530,265

Int. Cl.² B31F *5/06*

U.S. Cl. 156—505 **10 Claims**



1. An apparatus for splicing two sheets of material together in a desired relationship, said apparatus comprising:

a work surface on which said sheets can be positioned in said desired relationship;

a splicing assembly extending across said work surface, said assembly comprising:

a track extending across said work surface, said track having a cutting groove therein;

guide means extending across said work surface above said track;

means for securing said sheets on said work surface so that the common line of those portions of said sheets to be spliced overlies said cutting groove; and

a carriage movably mounted on said guide means, said carriage comprising:

means for cutting said sheets along said common line when said carriage is moved in a first direction along said guide means; and

means for applying adhesive tape material to said sheets along said common line to secure said sheets together in said desired relationship when said carriage is moved in a second opposite direction along said guide means;

means for moving said carriage along said guide means in said first and said seind directions.

3,957,568

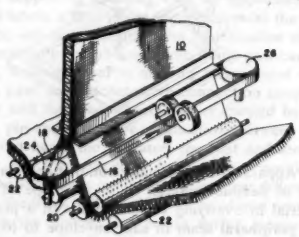
CUTTER FOR NON-WOVEN CARPET MACHINE

Martin L. Abel, Franklin, Mich., assignor to Permalock Company, Inc., Auburn Heights, Mich.

Filed Dec. 18, 1973, Ser. No. 425,890

Int. Cl.² B26D *1/48*, *1/54*; B32B *31/18*

U.S. Cl. 156—510 **6 Claims**



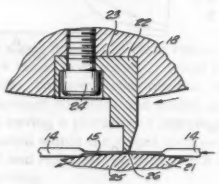
1. A machine for making non-woven bonded carpet, comprising bonding means for bonding a plurality of lengths of

material between opposing backing layers, a cutting mechanism comprising an endless cutting blade vertically disposed with a cutting edge along the top edge thereof, moving means for moving the blade continuously in one direction longitudinally, advancing means for advancing the lengths of material and backing layers vertically toward the blade, the blade being located so that a substantial length of the blade moves across the path along which the lengths of material are advanced to sever said lengths of material and form two lengths of carpet, guide means for guiding the blade in substantially a straight line across the entire width of said path, said guide means including a groove adapted to receive and guide the blade, and support means for supporting the blade, the support means including a plurality of spaced apart surfaces in the groove for engaging and supporting the side of the blade opposite the cutting edge.

3,957,569
APPARATUS FOR SEVERING AND SEALING THE ENDS OF A MULTI-PLY PAD

Ludwig W. Freitag, Elkhart Lake, Wis., assignor to Curt G. Joa, Inc., Sheboygan Falls, Wis.

Filed Jan. 27, 1975, Ser. No. 544,548
Int. Cl.² B32B *31/18, 31/20*
U.S. Cl. 156—515 **2 Claims**

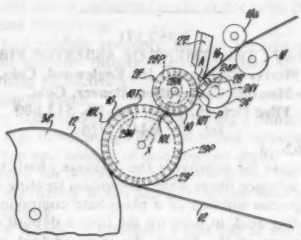


1. Severing and sealing apparatus for a multi-ply pad, said apparatus comprising coacting knife and anvil rotors, a combined severing and sealing tool, means mounting said tool on the knife rotor, said tool comprising an elongated blade having a knife edge at the leading edge of said blade in the direction of its rotation and which coacts with the anvil rotor for severing through the multiple plies of a pad therebetween and a blunt sealing heel adjacent said knife edge at the trailing edge of said blade in the direction of its rotation and which coacts with the anvil rotor for sealing together said multiple plies adjacent the line of severance therethrough substantially concurrently with the severing thereof, said anvil rotor having a substantially smooth cylindrical surface, said heel having a substantially flat portion disposed at an acute angle to a radial line through the axis of rotation of the knife rotor and the point of contact of the knife edge with the pad such that said flat portion will be substantially parallel to a tangent to said cylindrical surface at said point of contact in the sealing position thereof.

3,957,570
MACHINERY FOR PATCHING ENVELOPES AND THE LIKE

Herbert W. Helm, Hollidaysburg, Pa., assignor to F. L. Smithe Machine Company, Inc., Duncansville, Pa.

Continuation-in-part of Ser. No. 311,171, Dec. 4, 1972, abandoned, which is a continuation of Ser. No. 81,974, Oct. 19, 1970, abandoned. This application July 20, 1973, Ser. No. 381,108
Claims priority, application Germany, Oct. 13, 1971, 2150908
Int. Cl.² B32B *31/00*; B31B *1/00*
U.S. Cl. 156—519 **5 Claims**



1. A patch cutter and transfer device for cutting patches from patch web material and transferring the patches to moving envelope webs within which and from one to the other the areas to be patched may vary in size and in spacing to thereby vary the length of patch required to be applied thereto and to vary the per envelope cycle thereof, comprising,

a. means for moving an envelope web at a predetermined surface speed;

b. transfer and application cylinder means;

i. Separate means, independent of the next mentioned driving means, for driving said transfer and application cylinder means at the surface speed of the envelope web;

c. a cut-off cylinder;

i. separate means independent of said means for driving said transfer and application cylinder means for driving said cut-off cylinder at a surface speed related to the per envelope cycle of the envelope web being moved;

ii. said cut-off cylinder having at least one cutting knife at the exterior surface thereof;

d. a stationary cutter, operable with said cutting knife to cut patches from the patch web material and disposed adjacent a point of meeting of the transfer and application cylinder means with said cut-off cylinder a distance smaller than the patch to be cut;

e. means associated with said cut-off cylinder and said transfer and application cylinder means for holding each of the cut patches thereto and for ultimately releasing the patch for applying it to the envelope web;

f. means for feeding patch web material to said cut-off cylinder between said cutting knife and said stationery cutter.

i. separate variable drive means, independent of said means for driving said cut-off cylinder, for driving said feeding means to deliver the patch web material to said cut-off cylinder at surface speeds slower than and proportional to the surface speed of the envelope web being moved and slower than the surface speed of said cut-off cylinder,

whereby the leading portion of the patch web material prior to cut-off skids upon the surfaces of said cut-off cylinder and said transfer and application cylinder means;

the arrangement being such that said separate means for driving said transfer and application means at the surface speed of the envelope web, and said separate means for

driving said cut-off cylinder at a surface speed related to the per-envelope cycle of the envelope web being fed, and said separate variable drive means for driving said feeding means to deliver the patch web material constitute the sole means for varying the length of the patches transferred to the envelope web and for varying the timed application of the patches to the envelope web;

whereby the varying of patch length and the timed application thereof to an envelope web is accomplished without changing the diameters of said transfer and application cylinder means or said cut-off cylinder and without adjusting or changing said means for moving an envelope web or said means for driving said transfer and application cylinder means.

3,957,571

SURFACE TREATMENT OF ASBESTOS FIBERS

Frederick Mercer Bodycomb, Jr., Englewood, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Oct. 10, 1974, Ser. No. 513,800

Int. Cl.² B44D 1/16

U.S. Cl. 162—3 30 Claims

1. A process for improving the drainage characteristics of chrysotile asbestos fibers which comprises treating said fibers with an aqueous solution of a phosphate compound, or of a corresponding acid, to form on the fiber a deposit of up to 5 weight percent of the fibers, the improvement comprising subsequently adding to the treated fibers at least about 0.05 weight percent, based on the weight of the fibers, of a non-foaming anionic sulfonated dispersant.

3,957,572

PROCESS FOR THE MANUFACTURE OF PAPER PULP FROM WASTE PAPER

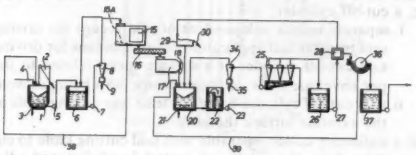
Erik Folke Eriksson, Johanneshov, Sweden, assignor to Mo ochs Domsjo AB, Ornskoldsvik, Sweden

Filed Mar. 13, 1974, Ser. No. 450,869

Claims priority, application Sweden, Mar. 19, 1973, 73038317

Int. Cl.² D21B 1/32, 1/34

U.S. Cl. 162—4 3 Claims



1. In a process for the manufacture of paper pulp from waste paper material, of the type wherein the waste paper material is diluted and comminuted in water in a pulper, precleaned for removal of coarse foreign contaminants, dewatered, kneaded in a kneading apparatus at high concentration, again diluted, after-cleaned for removal of finer or coherent soft foreign contaminants and dewatered to a concentration suitable for introduction into a paper-making machine in that order, characterized in that water respectively used for dilution and obtained during de-watering is circulated in two separate circuits upstream and downstream respectively of the kneading apparatus, that the dwelling time of the waste paper in the pulper is shorter than the time necessary for complete impregnation of the paper with water and just sufficient for obtaining pumpability, that the dewatering before kneading is performd so that the paper is completely impregnated, that the kneading apparatus comprises screw or vane-shaped working means operating in a casing and discharging said material at a final temperature of about 70° to 90°C, and that the concentration of the material discharged from the kneading apparatus is reduced to pumpability in a mixer in which the material is permitted to dwell a time sufficient to cause components of asphalt and bitumen type contained in the waste paper and dispersed in said material to agglomerate to lumps of such a size that they can be screened-off during after-cleaning, and screening off said agglomerated lumps.

3,957,573

PROCESS FOR PRODUCING INSULATING PAPER WHERE THE PAPER IS FRICTIONALLY CALENDERED

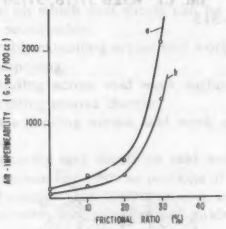
Haruo Miyamoto, Nagoya; Ikuo Igami, Tomei; Masaru Uehara, Nagoya; Hideo Fujita, Takarazuka; Hirotaka Itoh, Nishinomiya, and Zyozi Kan, Niihama, all of Japan, assignors to Dainichi-Nippon Cables, Ltd., Amagasaki and Mitsubishi Rayon Co., Ltd., Tokyo, both of, Japan

Filed Nov. 8, 1972, Ser. No. 304,882

Claims priority, application Japan, Nov. 9, 1971, 46-89606

Int. Cl.² D21H 5/20, 5/26

U.S. Cl. 162—102 29 Claims



1. A process for producing an insulating paper having high air-impermeability and high oil resistance suitable for use in an oil-filled electrical device which comprises forming a sheet of polyolefin fibers containing at least 70% by weight of polypropylene fibers having a denier of at least 0.5 and a birefringence of at least 2.5×10^{-3}, and frictionally calendering said sheet in the dry state at a frictional ratio of at least 15% and at a temperature in the range from 90°C to 160°C.

3,957,574

SIZING METHOD AND COMPOSITION FOR USE THEREIN

Thomas Edward Anderson, West Malling, England, assignor to Hercules Powder Company Limited, London, England

Continuation-in-part of Ser. No. 293,612, Sept. 29, 1972, abandoned. This application Jan. 6, 1975, Ser. No. 538,676

Claims priority, application United Kingdom, Oct. 20, 1971, 48856/71

Int. Cl.² C08L 3/00; D21D 3/00

U.S. Cl. 162—167 10 Claims

1. A sizing composition in the form of an aqueous emulsion consisting essentially of a ketene dimer sizing agent, an emulsifier and a dye fixative selected from the class of dye fixatives consisting of water-soluble dicyandiamideformaldehyde condensates obtained by the reaction of dicyandiamide, formaldehyde and an ammonium salt.

3,957,575

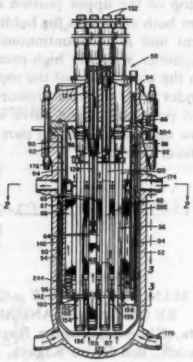
MECHANICAL DESIGN OF A LIGHT WATER BREEDER REACTOR

William L. Fauth, Jr., Germantown, Md.; Daniel S. Jones; George J. Kolsun, both of Pittsburgh, Pa.; John G. Erbes, San Jose, Calif.; John J. Brennan, Bethel Park, Pa.; James A. Weissburg, Pittsburgh, Pa., and John E. Sharbaugh, Acme, Pa., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 16, 1974, Ser. No. 461,475

Int. Cl.² G21G *1/02*; G21C *3/28, 19/00*

U.S. Cl. 176—18 **4 Claims**



1. In a light water breeder nuclear reactor comprising:

a. a pressure vessel comprising a vessel shell with coolant inlet nozzles, coolant outlet nozzles, an interior flange located between the inlet and outlet nozzles, and a closure head having a plurality of openings therein,

b. a core located within the vessel shell and having a plurality of fuel and reflector modules; each of said fuel modules comprising

an elongated, vertically movable assembly having a plurality of spaced apart fuel rods defining a single seed region with coolant passages therethrough, and;

a first elongated stationary assembly surrounding the periphery of said movable assembly and in juxtaposed relationship with at least two adjacent fuel module stationary assemblies, said stationary assembly having a plurality of spaced apart fuel rods defining a blanket region with coolant passages therethrough; and

each of said reflector modules comprising a plurality of second elongated stationary assemblies extending about the periphery of the core, said second stationary assemblies having a plurality of spaced apart blanket fuel rods defining a reflector region having coolant passages therethrough,

c. a core support structure within the pressure vessel, comprising:

a core barrel support flange affixed between the pressure shell and head and having openings therethrough,

an upper core barrel formed integrally on the core barrel support flange and having a plurality of openings therethrough, said barrel having an outwardly extending core barrel support flange,

a lower core barrel having a closed portion and an outwardly extending lip, said lip in supported contact with the pressure vessel flange and the closed portion having a plurality of openings therethrough to define a lower plenum chamber between the pressure shell and the closed portion;

an inlet barrel shield fixedly connected to the upper core barrel, and a bottom plate assembly connected to the inlet barrel shield barrel, said bottom plate assembly defining means for directing coolant flow from the pressure vessel inlet into the core,

d. a plurality of control drive mechanisms for longitudinally positioning said movable assemblies, said drive mechanism comprising:

a motor having a stator and rotor with a collapsible mechanism drive connection to a lead screw, the lead screw connected to the rotor capable of being displaced in an axially direction during the lead screw rotation;

a motor tube surrounding the motor and affixed thereto; and

a vessel nozzle connected to the motor tube; the improvement comprising:

the fuel module assembly, blanket stationary assembly, and reflector module stationary assembly each comprising respectively:

support shells;

top and bottom base plates having a plurality of openings therethrough and connected respectively to the top and bottom of said support shells;

means for supporting fuel rods within the assemblies alternately to the top and bottom base plates comprising:

a. means for attaching a first half of the fuel rods at the top thereof to the top base plate openings, the bottom of said first half of the fuel rods being spaced apart from said bottom base plate;

b. means for attaching a second half of the fuel rods at the bottom thereof to the bottom base plate, the top of said second half of the fuel rods being spaced apart from said top base plates;

c. spacer grids spaced along the length of the fuel rods each of said support shells having support posts spaced along the length of said rods and adjacent to the spacer grids, said support posts and spacer grids having hinge pin attachments and hinge pins passing therethrough for connecting spacer grids to said support posts.

3,957,576

METHOD FOR LOCALIZING FUEL CAN FAILURES IN NUCLEAR REACTORS

Pierre Boyer, Manosque; Henri Pellissier, Fontaine, and Michel Wacongne, Epinay-sur-Orge, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation-in-part of Ser. No. 369,231, June 12, 1973, abandoned. This application Sept. 3, 1974, Ser. No. 502,430

Claims priority, application France, June 28, 1972, 72.23402

Int. Cl.² G21C *17/00*

U.S. Cl. 176—19 LD **5 Claims**

1. Structure for the localization of fuel-pin can failures by tracer gases comprising a capsule containing the tracer gases within each fuel-pin can, a fusible seal closing said capsule, said capsule being of material having a melting point above

the operating temperature of the fuel-pins within the reactor, said fusible seal being of material having a melting point below

said temperature whereby the tracer gases are released into the interior of each fuel-pin at said temperature.

3,957,577

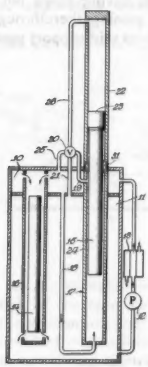
HYDRAULIC CONTROL ROD

Michael Treshow, Hinsdale, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 23, 1955, Ser. No. 517,665

Int. Cl.² G21C 7/16

U.S. Cl. 176—36 R **2 Claims**



1. In a nuclear reactor comprising an active portion having a vertical nuclear-fuel rod and a low-pressure chamber containing a coolant moderator in which the nuclear-fuel rod is positioned, a high-pressure chamber positioned over the low-pressure chamber, a vertical tube containing the fuel rod and extending into the high-pressure chamber, a pump for moving the coolant moderator from the low-pressure chamber to the high-pressure chamber and thereby causing the coolant moderator to be drawn through the tube over the nuclear-fuel element from the high-pressure chamber to the low-pressure chamber, and a vertical control rod, the combination with the chambers and the control rod, of a vertical cylinder housing the control rod and extending through the chambers and upwardly beyond the high-pressure chamber, the cylinder having an upper portion extending from the top to the high-pressure chamber and closely fitting the control rod and a lower portion extending from the bottom to the upper portion and loosely receiving the control rod so as to provide an annular space for coolant moderator about the control rod, means including a valve having a first position in which it connects the top of the upper portion of the cylinder with the low-pressure chamber and the top of the lower portion of the cylinder with the high-pressure chamber for moving the control rod upward, a second position in which it connects the top of the upper portion of the cylinder with the high-pressure chamber and the top of the lower portion of the cylinder with the low-pressure chamber for moving the control rod downward, and a third position in which it connects the top of the lower portion of the cylinder with the low-pressure chamber and blocks the top of the upper portion of the cylinder by cutting it off from both chambers for holding the control rod against movement and a line continuously connecting the bottom of the cylinder with the high-pressure chamber for cooperating with the connection of the top of the lower portion of the cylinder with the low-pressure chamber in the second and third positions of the valve in causing coolant moderator to flow upwardly over that part of the control rod located in said lower portion.

3,957,578

METHOD FOR MANUFACTURE OF α-GALACTOSIDASE BY MICROORGANISM

Shigeyoshi Narita, Kitami; Hirosuke Naganishi, Hiroshima; Akiyoshi Yokouchi, and Ichiro Kagaya, both of Kitami, all of Japan, assignors to Hokkaido Sugar Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1975, Ser. No. 538,468

Int. Cl.² C12D 13/10; C13J 1/00; C12D 13/02

U.S. Cl. 195—11 **6 Claims**

1. A method for the manufacture of α-galactosidase, which comprises culturing a mold *Absidia griseola* (ATCC No. 20430) or *Absidia griseola* var. iguchii (ATCC No. 20431) in a culture medium containing substances inductive of α-galactosidase under conditions permitting the formation of α-galactosidase, and recovering the α-galactosidase.

5. A method of reducing the raffinose content of beet juice or beet molasses which comprises adding to said juice or molasses mycelia of the mold *Absidia griseola* (ATCC No. 20430) or *Absidia griseola* var. iguchii (ATCC No. 20431) cultured in a culture medium containing a substance inductive of α-galactosidase under conditions permitting the formation of α-galactosidase or the α-galactosidase prepared from said mycelial matter, and keeping the resultant mixture under conditions of enzymatic activity for said α-galactosidase until a portion of said raffinose has been decomposed.

3,957,579

METHOD FOR PREPARING D-TARTARIC ACID

Eiji Sato, Zushi, and Akira Yanai, Kamakura, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 24, 1975, Ser. No. 571,222

Claims priority, application Japan, Apr. 30, 1974, 49-47525

Int. Cl.² C12B 1/00

U.S. Cl. 195—30 **12 Claims**

1. A method for preparing d-tartaric acid which comprises asymmetrically hydrolysing cis-epoxysuccinic acid in an aqueous medium in the presence of a microorganism selected from the group consisting of the genera Achromobacter and Alcaligenes having cis-epoxysuccinic acid-hydrolysing activity.

3,957,580

IMMOBILIZED MICROBIAL CELLS

Roger P. Nelson, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

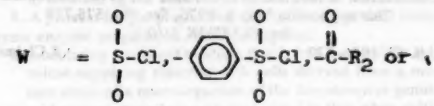
Filed Mar. 27, 1974, Ser. No. 455,143
Int. Cl.² C12K 1/00; C07G 7/02
U.S. Cl. 195—59 18 Claims

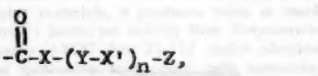
1. A process for immobilizing microbial cells comprising contacting said cells with a polyfunctional cross-linking reagent, contacting the so-treated cells in aqueous medium with a water-insoluble particulate polymer and continuing said contacting until said cells are covalently bonded to said polymer, said polymer resulting from polymerization, in the presence of a cross-linking monomer and polymerization initiator, of a monomer of the formula:

wherein

R_1 = hydrogen, methyl or chloro,

and





wherein

R_2 = halo, azido, 2,3-epoxypropoxy, 2,3-epithiopropoxy, N-(2,3-epoxypropyl)amino, N-[(p-diazonium chloride)-phenyl]amino, acryloyloxy, lower alkoxy carbonyloxy, or benzenesulfonyloxy,

X = oxygen or NR_3 where R_3 is hydrogen or alkyl of from 1 to 6 carbons,

Y = alkylene containing 2 or 3 carbons,

n = an integer of from 1 to 2,

Z = haloacetyl, 2-(4,6-dichloro)-s-triazinyl, p-toluenesulfonyl, p-(halomethyl)benzoyl, or cyano,

and

X' = X with the proviso that when Z is p-toluenesulfonyl, X' is oxygen.

3,957,581

METHOD OF PRODUCING PEPTIDASE

Sadanobu Tobe, Tokyo; Ryuichi Miyajima, and Koji Mitsugi, both of Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Feb. 13, 1975, Ser. No. 549,832
Claims priority, application Japan, Feb. 18, 1974, 49-19224
Int. Cl.² C12D 13/10
U.S. Cl. 195—65 5 Claims

1. A method of preparing peptidase capable of hydrolyzing a peptide into the constituent amino acids, which comprises culturing a peptidase producing strain of Cladosporium in an aqueous culture medium containing assimilable sources of carbon and nitrogen, inorganic salts, and minor organic nutrients until said peptidase accumulates in the culture, and recovering said accumulated peptidase.

3,957,582

PURIFICATION OF UROKINASE

Gene Alan Stried, Zion, and Peter George Sesin, Waukegan, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 20, 1974, Ser. No. 525,334
Int. Cl.² C07G 7/026
U.S. Cl. 195—66 B 6 Claims

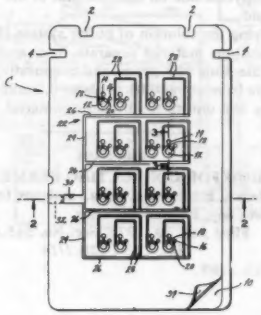
1. The process of purifying urokinase comprising preparing a clear solution thereof in an aqueous medium of pH 6 – 9 having an ionic strength of 2.0 – 5.0 mmho., placing said solution in contact with swelled beads of an average size between 40 – 120 microns of a basic anion exchange resin having chemically bound thereto at least 3.0 meq./g. of a tertiary or quaternary amine, allowing for sufficient time for ion exchange to take effect at the temperature between 0° C. and the boiling point of the aqueous solution, and separating the liquid phase from said resin having adsorbed thereto substantially all of the initially present impurities.

3,957,583

APPARATUS AND PROCESS FOR DETERMINING THE SUSCEPTIBILITY OF MICROORGANISMS TO ANTIBIOTICS

Sandra F. Gibson, St. Louis County, and Norman L. Fadler, St. Peters, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Dec. 2, 1974, Ser. No. 528,840
Int. Cl.² C12K 1/04
U.S. Cl. 195—103.5 R 15 Claims



1. A device for conducting antibiotic susceptibility tests on clinical specimens, said device comprising: a plate having detection wells therein and a filler passage leading to the wells, the plate also having an overflow of cavities communicating with each detection well downstream from the entry of the filler passage into such wells; means for isolating the wells, filler passage, and overflow cavities from the surrounding atmosphere; and a blend of culture medium and known antibiotics in at least some of the detection wells, the culture medium being sensitive to the microorganisms in the sense that the optical characteristics of the culture medium change when a microorganism is sustained in the culture medium, the culture medium further being selective in that it undergoes a change in optical characteristics only when a specific microorganism is sustained by it.

3. A process for determining the susceptibility of a specific microorganism to antibiotics, said process comprising: evacuating air from a well in which a selective culture medium is contained and from wells in which blends of the selective culture medium and known antibiotics are contained, said culture medium favoring the specific microorganism such that the light-transmitting characteristics of a mixture of the culture medium and water will change when the favored microorganism is sustained within and nourished by the medium;

replacing the evacuated air with a diluent mixture composed essentially of a clinical specimen diluted in water whereby the diluent mixture mixes with the selective culture medium in the wells; incubating the mixture of the blend and diluent mixture; and observing the wells for a change in the light-transmitting characteristics thereof.

3,957,584

DETECTION OF BETA-GALACTOSIDASE PRODUCING MICRO-ORGANISMS

Donald P. Kronish, Rockaway, and William D. Young, Montclair, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sept. 30, 1974, Ser. No. 510,816
Int. Cl.[2] C12K 1/04, 1/10
U.S. Cl. 195—103.5 R **17 Claims**

1. A method for preparing a diagnostic test system for detecting the production of β-galactosidase by bacterial hydrolysis of an o-nitrophenyl-β-D-galactopyranoside substrate which comprises:

A. Preparing an aqueous solution containing from about 0.5% to about 5.0% weight/volume, based on the volume of the total solution, of o-nitrophenyl-β-D-galactopyranoside and from about 25% to about 75% by volume of acetone;

B. Preparing a solution of a buffer system, which will maintain a pH of from about 6.5 to about 8.5, containing from about 0.5 molar to about 1.0 molar buffer;

C. Applying substrate solution (A) to a zone of a bibulous material and evaporating to dryness to provide from about 0.05 mg to about 3.0 mg of o-nitrophenyl-β-D-galactopyranoside on one test unit of the bibulous material; and

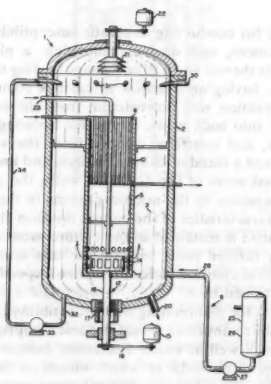
D. Applying the solution of buffer system (B) to a zone of the bibulous material separate from and contiguous to substrate zone (C) above and evaporating to dryness to provide from about 0.01 to about 0.1 millimoles of buffer on one test unit of the bibulous material.

3,957,585

METHOD FOR CONDUCTING FERMENTATION

Emil A. Malick, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 30, 1975, Ser. No. 545,546
Int. Cl.[2] C12B 1/14
U.S. Cl. 195—109 **6 Claims**



1. A method of culturing a microorganism by fermentation of a carbon and energy source, said method comprising:

a. at least substantially saturating and pressurizing a portion of a feedstock with an oxygen-containing gas;

b. introducing said feedstock into a fermenting reaction zone containing a microorganism for fermenting said feedstock; said reaction zone being at a pressure lower than the pressure of said feedstock so that a gas phase is formed in said reaction zone;

c. conducting fermentation in said reaction zone;

d. atomizing a liquid selected from the group consisting of feedstock, ferment or mixtures thereof in said reation zone during fermentation so that said atomized liquid contacts with said gas phase in an upper portion of said reation zone; and

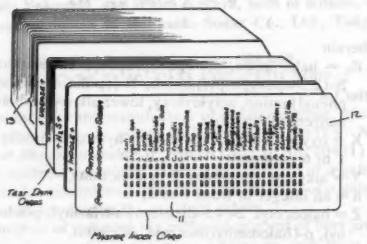
e. removing the product produced by the fermentation of the feedstock from said reaction zone.

3,957,586

PATHOTEC RAPID IDENTIFICATION SYSTEM

Arthur L. Babson, Chester, and John S. Loder, Bernardsville, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 541,909, Jan. 17, 1975, abandoned. This application May 8, 1975, Ser. No. 575,779
Int. Cl.[2] C12K 1/10
U.S. Cl. 195—127 **5 Claims**



1. In a system for identifying microorganisms, the combination of:

a series of cards comprising test data cards corresponding to a single biochemical reaction, and

a master index card;

all of said cards being the same size and shape whereby selected groups of cards may be stacked one upon the other in a uniform manner;

said master index card having an identification area thereon and indicia identifying specific microorganisms, and having a number of apertures adjacent and in lineal arrangement with the identifying indicia, and said test data cards having a plurality of coordinate locations on each face of each card corresponding to the apertures in the master index card when the master index card is placed in stacked relationship over the test data card, and apertures through the test data card at those locations corresponding to the biochemical reaction percentage of the identified microorganism having the corresponding aperture in the master index card.

3,957,587
PRODUCTION OF XYLOSE (DEXTROSE) ISOMERASE ENZYME PREPARATIONS

Frederick C. Armbruster, La Grange; Robert E. Heady, Park Forest, and Robert P. Cory, La Grange, all of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 417,989, Nov. 21, 1973, abandoned, which is a division of Ser. No. 181,639, Sept. 17, 1971, Pat. No. 3,813,318. This application June 23, 1975, Ser. No. 589,115

Int. Cl.² C12D *13/00, 13/10;* **C12K** *1/02*

U.S. Cl. 195—66 R **15 Claims**

1. A process for producing a xylose (dextrose) isomerase enzyme preparation which comprises:

a. culturing cells derived from a mutant strain of a microorganism of the *Streptomyces* genus in a nutrient medium, said mutant strain being chaaracterized in that when cultivated in a nutrient medium that is free of xylose and xylose-supplying materials, it produces at least 50% more xylose (dextrose) isomerase activity than *Streptomyces olivochromogenes* ATCC No. 21,114 under identical conditions of cultivation, and

b. obtaiing a xylose (dextrose) isomerase enzyme preparation that is capable of enzymatically isomerizing dextrose to levulose in the absence of added cobalt.

8. A process for the production of a xylose (dextrose) isomerase enzyme preparation, which comprises:

a. inoculating a nutrient medium that is free from xylose and xylose-supplying material with cells derived from a mutant strain of a microorganism of the *Streptomyces* genus, said mutant strain being characterized in that when cultivated in a nutrient medium that is free of xylose and xylose-supplying materials, it produces twice as much xylose (dextrose) isomerase activity than *Streptomyces olivochromogenes* ATCC No. 21,114 under identical conditions of cultivation to produce cells containing xylose (dextrose) isomerase,

b. fermenting the cells in said nutrient medium from (*a*) wherein at least the final stage of fermentation, the nutrient medium contains xylose; and

c. recovering the xylose (dextrose) isomerase enzyme produced.

3,957,588
EVAPORATIVE AND CENTRIFUGAL APPARATUS FOR EFFECTING CONCENTRATION AND/OR PURIFICATION OF FEED STOCKS

Gerald F. Humiston, South Barre, Vt., assignor to Pollution Control, Inc., South Barre, Vt.

Division of Ser. No. 369,515, June 13, 1973, Pat. No. 3,893,894. This application May 29, 1975, Ser. No. 581,801

Int. Cl.² B01D *3/00, 1/00, 1/22*

U.S. Cl. 202—172 **30 Claims**

1. A low temperature purification system operable for purposes of separating from a feed solution the solids and dissolved substances contained therein comprising:

a. a source of supply of a solution containing solids and dissolved substances;

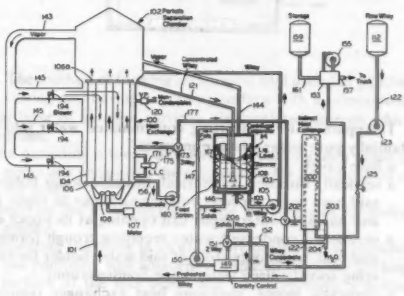
b. a centrifugal vacuum evaporator in communication with the source of supply for receiving solution therefrom operable to separate solids from the solution by centrifugal acceleration and to separate dissolved substances from the solution by vacuum distillation, said centrifugal vacuum evaporator including a stationary housing providing a chamber, rotatable means within said chamber for rotation of solution therewithin, drive means connected to said rotatable means operable for causing the rapid rotation of said rotatable means, an inlet for solution containing solids and dissolved substances, an outlet for solids adjacent the base of said chamber and an outlet for vapors adjacent the top of said chamber, said inlet for said centrifugal vacuum evaporator being in communication with said source of supply, and said chamber, source of supply and the connection therebetween comprising the solution intake portion of the purification system;

c. vacuum means operable for producing a vacuum;

d. indirect condenser means connected between said vapor outlet of said centrifugal evaporator and said vacuum means, said condenser means being operable at reduced pressure during operation of said vacuum means and said condenser means in turn producing a reduced pressure within said centrifugal evaporator to cause at least a portion of the solution in said centrifugal evaporator to vaporize to produce vapors therefrom for transmission to said condenser means, said condenser means including heat exchange tubing supported therewithin in the path of flow of the vapors received from said centrifugal evaporator, the interior of said tubing being in communication with said solution intake portion to provide solution flowing therethrough at a temperature below the condensation temperature of the vapors to cause the vapors coming into contact with said tubing to condense to produce a cendensate with the heat produced during condensation being absorbed by the solution flowing through said tubing;

e. outlet means connected to said condenser means for discharging the condensate therefrom; and

f. heat recovery means comprising first conduit means communicating with said solution intake portion and the inlet

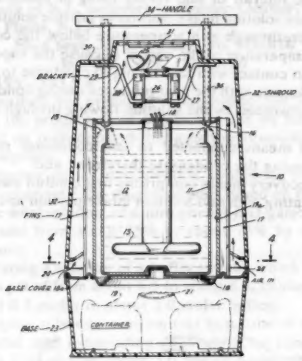


end of said tubing supported in said condenser means, mechanical means for providing additional heat energy in the system to provide a temperature in the vapors being condensed above that of the solution flowing through said condenser means, and second conduit means connecting the discharge end of said tubing supported in said condenser means to said centrifugal vacuum evaporator thereby establishing a flow loop between said source of supply, said centrifugal vacuum evaporator and said tubing supported in said condenser means by means of said first and second conduit means through which solution passes from said source of supply through said tubing of said condenser means wherein the solution is heated by the heat produced during condensation thereby increasing the temperature of the solution before the latter is charged to said centrifugal vacuum evaporator wherein the heated solution mixes with the solution in said centrifugal vacuum evaporator to effect direct heat transfer therewithin and cause the temperature of the solution in said centrifugal vacuum evaporator to remain above a preselected minimum temperature as a result of the heat which is lost during evaporation in said centrifugal vacuum evaporator being replaced by the heat which is produced during condensation in said condenser means.

3,957,589
WATER PURIFICATION APPARATUS

Frederick G. Mayer, 528 Flax Hill Road, South Norwalk, Conn. 06854

Continuation of Ser. No. 205,606, Dec. 7, 1971, abandoned.
This application June 21, 1974, Ser. No. 481,608
Int. Cl.² B01D 3/00
U.S. Cl. 202—185 B 8 Claims



1. Apparatus for converting contaminated water into substantially pure water which comprises:

a base cover;

a vertically disposed, cylindrical, heatable water holder on said base cover for heat volatilizing water to vapor form and having a water vapor exit opening at its upper end;

a perimetric condensed water receiving trough formed in said base cover outwardly of said water holder for recovering so-volatilized water upon condensation;

a vertically axised, enclosing heat exchanger removably positioned on said base cover in sealing engagement therewith outwardly of said trough and in surrounding spaced relation to said water holder, and defining a flow directing condensation area on the interior surface thereof for condensing so-volatilized water emanating from said water vapor exit opening and leading to said trough and a heat dissipation area on the exterior surface of said exchanger including a plurality of cooling fins T-shaped in cross-section with radially outstanding webs from said exterior surface coplanar with the exchanger axis and spaced apart from one another to define therebetween corresponding subdivided cooling air flow spaces;

a shroud removably positioned on said heat exchanger in surrounding spaced relation thereto and defining therewith an encompassing peripheral positive flow coolng air passageway outwardly confining the exterior surface of said heat exchanger and fins and in flow exchange communication therealong with said subdivided flow spaces;

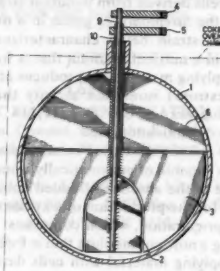
air entrance and exit means for said air passageway in opposite ends of said shroud; and

air moving means operatively positioned on said shrouder for inducing positive flow of cooling air from said entrance to said exit means through said air passageway and across the exterior surface of said heat exchanger and said cooling fins and in flow exchange with the subdivided spaces between said cooling fins, for enhanced accelerated dissipation and removal of the heat from the so-volatilized water as it is condensed on said condensing area.

3,957,590
VALVE ARRANGEMENT FOR COKE OVEN OFFTAKE CONDUITS

Wolfgang Rohde, Essen, Germany, assignor to Bergwerksverband GmbH, Essen, Germany

Filed May 20, 1974, Ser. No. 471,729
Claims priority, application Germany, May 19, 1973, 2325503
Int. Cl.² C10B 27/06; F16K 31/128
U.S. Cl. 202—258 6 Claims



1. In a coking oven, having a chamber with a conduit for withdrawing gas from said chamber, a draft control interposed in said conduit and occupying a plane defining the internal cross-sectional area of said conduit for regulating the pressure therein, the improvement wherein said draft control comprises a fixedly mounted baffle means extending across a first portion of the internal cross-sectional area of said conduit, a flow control valve element extending across a second portion of the internal cross-sectional area of said conduit, a throttle flap element extending across a third portion of the internal cross-sectional area of said conduit and responsive to the pressure of gas in said chamber, and control means responsive to the movements of said throttle flap element and operable to open and close said flow control valve element.

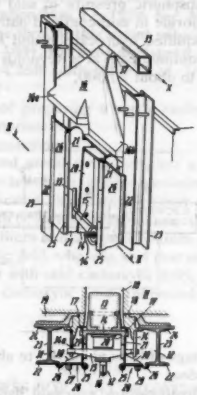
3,957,591
COKING OVEN

Johann G. Riecker, Breitscheid, Germany, assignor to Hartung, Kuhn & Co., Maschinenfabrik GmbH, Dusseldorf, Germany

Filed May 20, 1974, Ser. No. 471,538
Claims priority, application Germany, May 25, 1973, 2326825
Int. Cl.² C10B 27/04
U.S. Cl. 202—263 4 Claims

1. In an arrangement for removing gas emerging through the vertical and horizontal cracks bounding a closed coke oven door, in combination, a pair of vertical channels each extending along a respective one of the vertical cracks and each comprised of a first, a second and a third wall, the first wall being permanently secured to the door for movement with the door and being located to one side of the respective crack, the second wall being permanently secured to the front wall of the oven and located to the other side of the respective crack, whereby gas emerging from a vertical crack immediately finds itself intermediate the first and second walls of the associated channel, the third wall being pivotally connected to the first wall and swingable into a position in which the third wall presses against the second wall so as to complete the respective channel; means for holding each third wall in such posi-

tion; a hood structure extending over the upper end of the coke oven door for capturing gas escaping from the upper

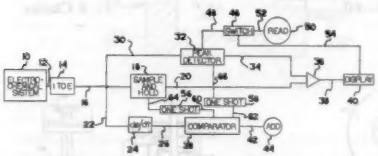


horizontal crack; and means for sucking gas from the channels and from the hood.

3,957,592
MEASUREMENT OF POLAROGRAPHIC CURRENT

Chung-Chang Young, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed July 29, 1974, Ser. No. 492,706
Int. Cl.² G01N 27/46
U.S. Cl. 324—29 12 Claims



9. In a method of measuring biological fluids wherein a polarographic cell is continuously washed by a buffer solution and wherein an electrical cell current is generated by the oxidation of hydrogen peroxide carried by the buffer solution past the cell electrodes, an improved method of measuring said cell current which comprises the steps of:

electronically converting said cell current to an equivalent cell signal voltage;

electronically generating a signal quantity representing the time rate of change of said cell signal voltage;

electronically generating a first signal when said time rate of change is less than a pre-selected value;

electronically generating a second signal when said time rate of change is greater than said pre-selected value;

electronically holding and passing as a constant voltage signal the value of said cell signal voltage present at the time of generation of said second signal;

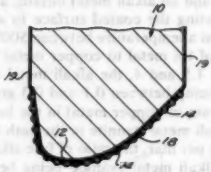
electronically measuring and holding the maximum value reached by said cell signal voltage; and

electronically subtracting said constant voltage signal from said maximum value of said cell signal voltage to thereby generate a difference voltage.

3,957,593
METHOD OF FORMING AN ABRASIVE TOOL

William M. Haack, St. Louis, Mo., assignor to Keene Corporation, New York, N.Y.

Filed Jan. 31, 1975, Ser. No. 545,984
Int. Cl.² C25D 5/02, 7/04
U.S. Cl. 204—16 4 Claims



1. The method of forming an abrasive tool useful in grinding and cutting and having a working surface with a substantially single layer of abrasive particles electroplated thereon which comprises:

first providing a tool blank having a working area made of metal and presenting the required profile configuration of the tool;

preparing the metal surface of the working area for nickel plating;

supporting the blank in an enclosure presenting an impervious confining wall adjacent but spaced from the working surface of the tool blank and also presenting a porous mesh surface beneath the space between the confining wall, and working surface with the openings in the screen being smaller than the cross-sectional dimension of the hereinafter referred to abrasive particles;

arranging a compacted mass of abrasive particles in the space between the confining walls, working surface and porous screen surface, with abrasive particles in engagement with all portions of the metallic working surface;

covering the blank while supported in the enclosure with nickel plating solution and continuously passing nickel plating solution downwardly over the working surface and through the mass of abrasive particles in the presence of metallic nickel connected in an electrical circuit as an anode and with the working surface connected as a cathode until a thin coating of nickel is applied to the working surface and sides of the first layer of abrasive particles in immediate contact therewith so as to form an initial nickel plating extending for a height of no more than approximately ⅓ the height of the abrasive particles and lightly securing the first layer of abrasive particles to the working surface;

removing the surplus abrasive particles above the aforesaid first layer from the area surrounding the working surface;

and thereafter applying further nickel plating to the working surfaces and first layer of abrasive particles so as to adhere to the sides of the abrasive particles for approximately ½ to ⅝ of the height thereof to firmly secure them in place with the top surfaces of the particles being substantially free of plating and projecting above the surface of the nickel plating between the particles.

3,957,594
SURFACE TREATMENT OF PARTS OF FERROUS ALLOYS

Bernard Grellet, 67 Cours Fauriel, 42000 Saint-Etienne, France

Filed Sept. 9, 1974, Ser. No. 504,091
Claims priority, application France, Sept. 14, 1973, 73.33032
Int. Cl.² C25D *5/50, 3/58*
U.S. Cl. 204—37 T **1 Claim**

1. A process for the treatment of the surface of a ferrous alloy, comprising the steps of

a. depositing a copper-tin alloy on the said surface by electrolysis in a bath containing monovalent copper ions, tetravalent tin ions, an alkali metal hydroxide, an alkali metal cyanide, alkali metal carbonates, alkali metal stannites, and an alkali metal citrate, and

b. subjecting the coated surface to a diffusion heat treatment at a temperature between 500° and 580°C., the mass ratio of tin metal to copper metal in the bath being between 1.5 and 4, the alkali metal citrate content of the bath being between 0.1 and 0.3 gram of the said citrate per gram of copper metal in the bath, the concentration of alkali metal stannite in the bath being between 15 and 30 mg per liter, the ratio of free alkali metal hydroxide to free alkali metal cyanide being between 1 and 1.5, the concentration of free alkali metal hydroxide of the bath being between 12 and 20 grams per liter, the concentration of alkali metal carbonates in the bath being between 30 and 200 grams of carbonates per liter, the pH of the bath being between 13.5 and 14, this pH being maintained between these two values by varying the alkali metal hydroxide content of the bath, the temperature of the bath being between 50° and 60°C., the cathodic current density being between 3 and 10A/dm², the anodic current density being between 1.5 and 7A/dm², the diffusion heat treatment being effected in a neutral or reducing atmosphere for a time between 1 and 3 hours.

3,957,595
ZINC ELECTROPLATING

Paul DuBrow, Chicago, and Moneeb Zakaria, LaGrange, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jan. 10, 1975, Ser. No. 540,198
Int. Cl.² C25D *3/22*
U.S. Cl. 204—55 R **2 Claims**

1. An improved method of zinc electroplating a base metal which comprises: adding from 0.05 to 3.0% by weight of a polyquaternary ammonium salt which is the reaction product of methyl chloride and polyethylenepolyamine which is formed by the reaction of ammonia and ethylene dichloride, with the ratio of ethylene dichloride to ammonia ranging from 6:1 to 2:1, to an aqueous alkaline zinc plating bath, and then electroplating the base metal to place a zinc coating on the base metal.

3,957,596
PRODUCTION OF FLUORINATED HYDROCARBONS

Peter Seto, Mississauga, Canada, assignor to Ontario Research Foundation, Mississauga, Canada

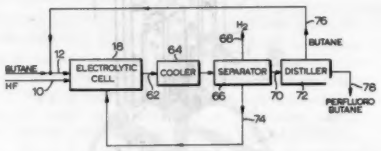
Filed May 21, 1975, Ser. No. 579,379
Claims priority, application United Kingdom, May 21, 1974, 22669/74
Int. Cl.² C25B *3/08, 15/08, 11/04*
U.S. Cl. 204—59 F **10 Claims**

1. A process for the production of a fluorinated hydrocarbon by electrofluorination which comprises.

passing a liquified C_2 to C_3 hydrocarbon and liquified hydrogen fluoride along a confined flow path between a nickel anode and a conductive metal cathode spaced apart from about 0.05 to about 0.1 inches, in the substantial absence of externally-added electrical conductivity-improving additives,

maintaining said hydrocarbon and hydrogen fluoride in said liquified form along said confined path by the application of superatmospheric pressure to said hydrocarbon and hydrogen fluoride in said confined path,

flowing said liquified hydrocarbon and hydrogen fluoride along said confined path at a Reynolds Number value of about 6000 to about 20,000,



applying a voltage of from about 4.5 to about 7 volts across said electrodes,

reacting said hydrocarbon with said hydrogen fluoride in said confined path under the influence of the electrical energy applied across the electrodes,

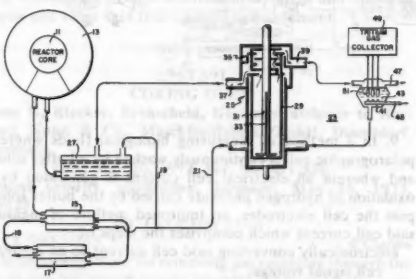
removing reaction mixture from said confined path, and

separating a fluorinated hydrocarbon from said reaction mixture.

3,957,597
PROCESS FOR RECOVERING TRITIUM FROM MOLTEN LITHIUM METAL

Victor A. Maroni, Naperville, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 28, 1974, Ser. No. 473,529
Int. Cl.² C25B *1/02;* **C01B** *1/02*
U.S. Cl. 204—60 **8 Claims**



1. A process for the separation of tritium from lithium metal including lihium tritide (LiT), said lithium tritide formed from tritium bred in the neutron irradiation of said lithium, said process comprising:

intimately contacting said lithium metal with a molten salt to distribute lithium tritide between liquid phases of said molten salt and said lithium metal;

separating said molten salt phase from said liquid lithium metal phase; and

separating tritium from said molten salt by forming a hydrogen gas including tritium isotope and collecting said gas.

3,957,598

METAL HYDRATES AND SALTS OF CARBOXYLIC ACIDS

George G. Merki, 46 Sunset Court, Haworth, N.J. 07641

Continuation of Ser. No. 255,758, May 22, 1972, abandoned. This application May 13, 1974, Ser. No. 469,125

The portion of the term of this patent subsequent to Dec. 24, 1991, has been disclaimed.

Int. Cl.[2] C25B *3/00*; C07F *7/24*, *3/06*, *5/06*

U.S. Cl. 204—72 9 Claims

1. A method of preparing a metal-carboxylic acid compound which comprises:

reacting, by contacting:

a. an activated metal comprising (*i*) a high purity first metal selected from group consisting of aluminum, zinc, magnesium, lead, nickel, silver and copper, permeated with (*ii*) a second metal selected from mercury, indium, gallium and alloys of indium and gallium; and

b. a carboxylic acid, whereby said first metal is consumed in reaction with said carboxylic acid, thereby forming said metal-carboxylic acid compound.

3,957,599

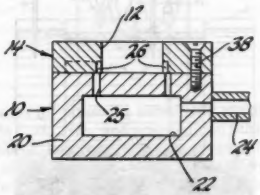
PROCESS FOR ELECTROWINNING

James H. Lindsay, Clarkston, and John W. Neumann, Birmingham, both of Mich., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Oct. 2, 1974, Ser. No. 511,391

Int. Cl.[2] C25C *1/00*, *7/00*

U.S. Cl. 204—105 R 10 Claims



1. A process for plating a metal onto a substrate which comprises forming an electrolyte solution which contains a metal to be plated in a form suitable for electrolytic deposition, placing a positively-charged manifold in the electrolyte solution as an anode, said manifold anode having at least one opening therein, placing a negatively-charged substrate in the electrolyte solution as a cathode, said cathode substrate being disposed in the electrolyte so as to be in substantial parallel relationship with the opening in said manifold anode, pumping a fluid through the manifold and out through the opening therein, causing said fluid to form an outwardly expanding vortex as it is discharged from said opening in a direction that is substantially perpendicular to said cathode substrate, maintaining the distance between the manifold anode and the cathode substrate such that the fluid flow at the surface of the cathode substrate is substantially parallel thereto and passing an electric current through the electrolyte solution between the manifold anode and the cathode substrate at a current density that is sufficient to effect deposition of the metal in the electrolyte solution onto the cathode substrate.

3,957,600

METHOD OF AND ANODES FOR USE IN ELECTROWINNING METALS

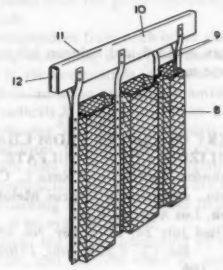
Andrew George Ives, Kidderminster; John Roger Bawden Gilbert, Sutton Coldfield; Jan Stephan Jacobi, Wolverhampton; Ian Robert Scholes, Sutton Coldfield, and David John Astley, Selly Oak, all of England, assignors to IMI Refinery Holdings Limited, Staffordshire and Imperial Metal Industries (Kynoch) Limited, Birmingham, both of England

Filed Dec. 20, 1974, Ser. No. 534,867

Claims priority, application United Kingdom, Dec. 27, 1973, 59795/73

Int. Cl.[2] C25C *1/00*; C25B *11/10*

U.S. Cl. 204—105 R 18 Claims



1. A method of electrowinning metal comprising electrolysing an aqueous solution of metal using as an anode an alloy containing one or more high melting point passive film-forming metals selected from the group consisting of titanium, zirconium, niobium and tantalum and one or more of the elements of atomic numbers 23–29 in the Periodic System of Elements, the amount of elements 23–29 being greater than that at which passivation of the alloy occurs and less than that amount at which dissolution of the alloy occurs at more than half the faradaic dissolution rate.

3,957,601

ELECTROCHEMICAL MINING

William F. Drinkard, Jr., Charlotte, and Henry S. Brown, Raleigh, both of N.C., assignors to Mineral Research & Development Corporation, Charlotte, N.C.

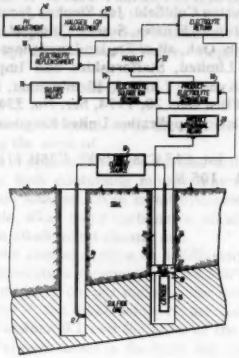
Filed May 17, 1974, Ser. No. 470,808

Int. Cl.[2] C25C *1/12*, *1/06*, *1/16*, *1/20*

U.S. Cl. 204—105 R 17 Claims

1. A method for the direct extraction of metal values from eath deposits of sulfide ores comprising attaching a positive source of direct current to a conductive deposit of sulfide ore to form an anode, contacting said deposit with a halogen salt containing electrolyte, positioning a cathode in said electro-

lyte, passing a decomposition voltage from said anode to said cathode to decompose said anode, said electrolyte having a



pH of less than about 5 and halogen ion concentration of at least about one molar.

3,957,602

RECOVERY OF COPPER FROM CHALCOPYRITE UTILIZING COPPER SULFATE LEACH

Robert K. Johnson, Denver, and Enzo L. Coltrinari, Arvada, both of Colo., assignors to Cyprus Metallurgical Processes Corporation, Los Angeles, Calif.

Filed July 24, 1974, Ser. No. 491,275
Int. Cl.[2] C22B *3/00, 15/08*
U.S. Cl. 204—106 25 Claims

1. A process for hydrometallurgically recovering elemental copper from chalcopyrite comprising:

reacting the chalcopyrite with a copper sulfate solution at a temperature and mole ratio sufficient to form an insoluble copper sulfide consisting essentially of digenite, a soluble iron sulfate and sulfuric acid;

separating the copper sulfide from the iron sulfate; and

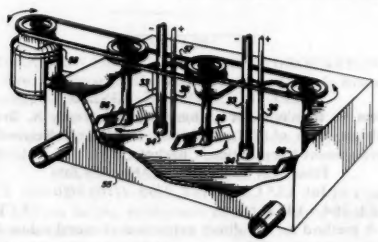
recovering the elemental copper from the copper sulfide.

3,957,603

ELECTROLYTIC GOLD RECOVERY AND SEPARATION PROCESS

William A. Rhodes, Phoenix, Ariz., assignor to Electromet, Inc., Phoenix, Ariz.

Filed June 14, 1974, Ser. No. 479,284
Int. Cl.[2] C25C *1/20*
U.S. Cl. 204—111 16 Claims



1. An electrochemical process for the extraction of gold from low-yield ores comprising:

mixing milled gold bearing ore with water and sodium chloride in a first container to form a slurry,

placing a positively charged anode in said first container to extend below the surface of said slurry, said slurry forming a first electrolyte,

placing a negatively charged cathode in a second container containing a second electrolyte, said second container formed at least in part by a porous fluid isolating material,

connecting said second container to said first container below the surface of the slurry in said first container so that upon the passage of electric current between said anode and cathode through said porous fluid isolating material chlorine generated at the anode and sodium hydroxide generated at the cathode are kept separated in said first and second containers,

thereby allowing nascent chlorine generated at said anode to disperse in said slurry to solubilize gold particles in said slurry into gold chloride thereafter to be separated from said slurry as a pregnant liquor, and

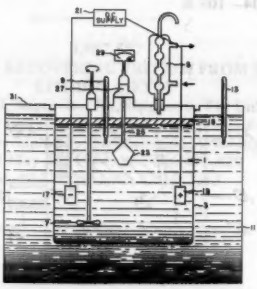
dechlorinating said pregnant liquor to release gold in the form of colloidal particles.

3,957,604

METHOD AND APPARATUS FOR ISOTHERMAL CRYSTAL GROWTH

Michelangelo Delfino, Ossining, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Mar. 17, 1975, Ser. No. 558,935
Int. Cl.[2] C23B *1/04, 9/00*
U.S. Cl. 204—130 10 Claims



1. A method of isothermally manufacturing crystals comprising preparing a saturated aqueous solution of a water soluble ionizable salt the dissociated cation of which is less reducible than H+ and the dissociated anion of which is less oxidizable than OH^-, subjecting said saturated solution to electrolysis while preventing evaporation thereby causing said solution to lose water under isothermal conditions and crystals of said salt to form.

3,957,605

PROCESS FOR RADIATION COCROSSLINKING WATER SOLUBLE POLYMERS AND PRODUCTS THEREOF

Per G. Assarsson, Montclair, N.J., and Paul A. King, Warwick, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 395,553, Sept. 10, 1973, Pat. No. 3,898,143, said Ser. No. 395,553, is a continuation of Ser. No. 152,370, June 11, 1971, abandoned. This application June 30, 1975, Ser. No. 592,201
Int. Cl.[2] C08F *8/00*
U.S. Cl. 204—159.14 8 Claims

1. A process for cocrosslinking at least two water soluble polymers one of which is poly(ethylene oxide) and the other is a second polymer selected from the group consisting of polyvinyl alcohol, polyvinyl pyrrolidone, polyacrylamide,

poly-4-vinyl-n-butyl-pyridinium bromide and polyvinylmethyl ether, said process comprising the steps of:

a. forming an aqueous solution comprising up to 50 per cent by weight of poly(ethylene oxide) and said second polymer,

b. adjusting the pH of said solution to within the range of from about 2 to about 11,

c. intimately mixing said solution to form a homogeneous or heterogeneous micro-phase system, and

d. before any substantial phase separation, exposing said solution to ionizing radiation of a sufficient dosage and for a period of time to form a gel.

3,957,606

ELECTROCHEMICAL PRODUCTION OF SUBSTITUTED PYRIDINES

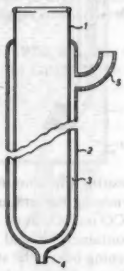
Robert Alfred Shaw, Chislehurst, England, assignor to Birkbeck College, England

Filed Oct. 18, 1974, Ser. No. 516,196

Claims priority, application United Kingdom, Oct. 25, 1973, 49756/73

Int. Cl.² B01K *1/00;* **C07C** *213/02*

U.S. Cl. 204—165 **6 Claims**



1. A process for preparing substituted pyridines of the general formula $C_5H_{5-n}NR_n$, and acid addition salts thereof, where R represents at least one member selected from the group consisting of alkyl, amino, cyano, carboxyl, pyridyl and pyridyl substituted by at least one member selected from the group consisting of alkyl, amino, cyano and carboxyl, and *n* represents an integer of from 1 to 5 which process comprises passing a silent electrical discharge through pyridine, or at least one alkyl-substituted pyridine, or mixtures of pyridine with at least one alkyl-substituted pyridine wherein the voltage of said alternating electrical current is in the range from 2.5 to 10Kv and the frequency of said alternating current is in the range from 10 to 100 cycles per second.

3,957,607

PROCESS FOR THE PREPARATION OF LIPIDE SOLUBLE COMPLEXES OF CATIONS, APPLICATION OF THE PROCESS AND USE OF THE COMPLEXES

Wilhelm Simon, Oberembrach, and Ernö Pretsch, Zurich, both of Switzerland, assignors to W. Moller Glasblaserei, Zurich, Switzerland

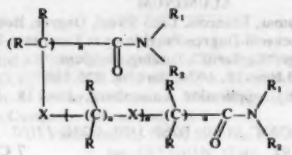
Filed Apr. 19, 1973, Ser. No. 352,634

Claims priority, application Switzerland, Apr. 24, 1972, 6064/72

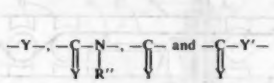
Int. Cl.² G01N *27/26, 27/30;* **B01D** *13/02*

U.S. Cl. 204—180 P **6 Claims**

1. A process for the determination of the concentration of cations and performing electrodialysis using a membrane made by the process which comprises reacting in said membrane an uncharged complex forming substance which forms lipide soluble complexes with the cations whose concentrations are to be determined, said uncharged complex forming substance having the formula I



in which X is selected from the group consisting of



wherein R'' is selected from the group consisting of hydrogen and organic radicals,

Y and Y' are independent from each other and are selected from the group consisting of oxygen and sulphur atoms and wherein in the compounds of formula I at least one X is other than an ester an an acid amide group, and wherein the radicals R are selected from the group consisting of hydrogen and organic radicals wherein two radicals R can form, together with the carbon atom and atoms to which they are bonded, a ring-structure which may be a heterocyclic ring; R_1 and R_2 are selected from the group consisting of hydrogen and organic radicals, and when R_1 is an organic radical,

R_2 is selected from the group consisting of hydrogen and organic radicals, and wherein when R_1 and R_2 together with the nitrogen atom of a group

of formula I form a heterocyclic radical and when wherein R_1 of the two groups

of the formula I form together a group which closes the substance of formula I to form a cyclic structure, a is a value selected from 0 and in integer having a maximum value of 11 and the n's are independent from each other and are integers of from 1 – 15 and the sum of all the members of the chain, when the substance of formula I is a straight chain and when the compound of the formula I has a cyclic structure, the members of the ring being formed by X and groups

is not more than 50 with a cation which is a metal or ammonium ion.

3,957,608

PROCESS FOR THE SURFACE OXIDISATION OF ALUMINUM

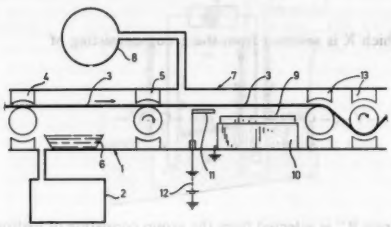
Dominique, Thomas, Francois, Leon Streel, Ougree, Belgium, assignor to Cockerill-Ougree-Providence et Esperance-Longdoz, en Abrege "Cockerill", Seraing, Belgium

Filed Nov. 18, 1974, Ser. No. 525,448

Claims priority, application Luxemburg, Jan. 15, 1974, 69164

Int. Cl.² C23C *15/00*; B23P *3/20*; C23C *13/10*

U.S. Cl. 204—192 7 Claims



1. A process for the surface oxidisation of an aluminium coating deposited on a steel sheet, comprising passing the aluminium coated sheet through an enclosure, generating a vacuum of from 10^{-1} to 10^{-3} Torr in said enclosure in which remains a residual gas consisting of argon and oxygen, having an aluminium target in said enclosure, creating an intense continuous electrical field in said enclosure so as to form positively ionised argon atoms which are aimed at said aluminium target for removing from the latter aluminium atoms which combine with oxygen present within said enclosure to form alumina which is deposited in a layer on said aluminium coating.

3,957,609

METHOD OF FORMING FINE PATTERN OF THIN, TRANSPARENT, CONDUCTIVE FILM

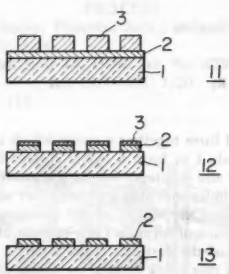
Akira Sasano, Kodaira; Kikuo Douta, Hachioji, and Mikio Ashikawa, Koganei, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 12, 1974, Ser. No. 505,598

Claims priority, application Japan, Sept. 28, 1973, 48-108374

Int. Cl.² C23C *15/00*

U.S. Cl. 204—192 10 Claims



1. A method of forming a fine pattern of a thin, transparent, conductive film of SnO_2, comprising forming a thin, transparent, conductive film of SnO_2 on a dielectric substrate; vapor-depositing a thin film of a metal selected from the group consisting of aluminum, chromium and manganese directly on said thin, transparent, conductive film of SnO_2; etching said thin metal film into a mask pattern; and sputter etching said thin, transparent, conductive film by the bombardment through said mask pattern with ions of gas accelerated under the influence of an RF electric field.

3,957,610

CELL FOR MEASURING THE AMOUNT OF CO IN A GAS

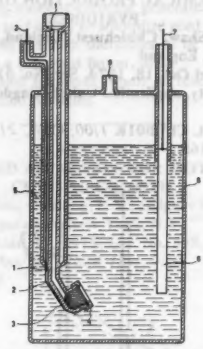
Rudy André Falkenburg; Antonius Wilhelmus Cornelis van Kemenade, both of Eindhoven, Netherlands, and Bernhard Lersmacher, Aachen, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 26, 1974, Ser. No. 509,481

Claims priority, application Netherlands, Oct. 1, 1973, 7313451

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 R 3 Claims



1. A cell for measuring the amount of CO in a gas by electrochemically determining the amount of iodine liberated by the reaction of the CO on I_2O_5 in an electrolytic solution, said cell comprising a container for said solution, a gas inlet tube with a gas outlet opening below the surface of said solution for transporting the CO containing gas into said solution, a porous electrically conductive material electrode positioned to plug the outlet opening of said gas inlet tube selected from the group consisting of foamed carbon coated with pyrolytic graphite, carbon fabric coated with pyrolytic graphite and graphite felt coated with pyrolytic graphite and a silver electrode positioned in said solution and away from said gas inlet tube.

3,957,611

ATMOSPHERE MONITORING ELECTROCHEMICAL CELL

Robert B. Moll, Havre de Grace, Md.; William J. Barrett, Birmingham, Ala.; Eugene R. Kuczynski, Glenside, and Earl W. Shaffer, Jr., Warrington, both of Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

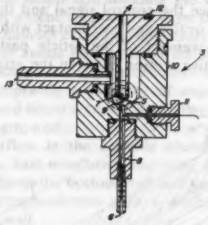
Filed Oct. 16, 1968, Ser. No. 768,560

Int. Cl.² G01N *27/26*

U.S. Cl. 204—195 B 13 Claims

1. An electrochemical cell for continuously and rapidly detecting sub-microgram quantities of toxic compounds irrespective of cell angular attitude comprising a cell body means, a reaction chamber means located within said cell body means, a first inlet means within said cell body means and connecting said reaction chamber means with the environment outside of said cell, a first electrode means within said reaction chamber means adapted to function as a measuring electrode, a second inlet means within said cell body means and connecting said reaction chamber means with an electrolyte reservoir means, a second electrode means within said second inlet means and adapted to function as a reference electrode, fiberglass thread means connecting said first and second electrode means, an outlet means connecting said reaction chamber means with the environment outside of said

cell, a temperature compensating means connected across said first and second electrode means and an electrode means



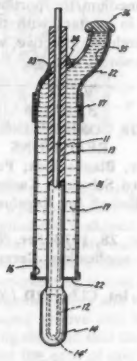
adapted to react with said toxic compounds to produce an electrical signal.

3,957,612

IN VIVO SPECIFIC ION SENSOR

Leonard W. Niedrach, and Oliver H. LeBlanc, Jr., both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed July 24, 1974, Ser. No. 491,605
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—195 M 2 Claims



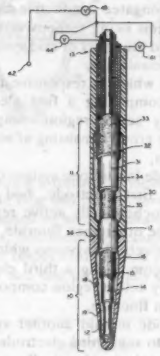
1. An in vivo specific ion sensor which comprises a flexible metallic elongated electrode lead, an electrochemically active portion at one end thereof, a first immobilized electrolyte coating the electrochemically active portion, a membrane barrier selectively permeable to a particular ionic species encapsulating the electrochemically active portion and the electrolyte, electrical insulation surrounding and adhering to the electrode lead, an electrically-insulating irregularly-curved tube surrounding at least a portion of the electrode lead and electrically insulated therefrom, one end of the tube being disposed adjacent to and spaced from the membrane barrier and being closed by a second ion-permeable membrane, an aperture in the tube, a second immobilized electrolyte contained within the tube and in contact with the second ion-permeable membrane, a metallic reference electrode element partially within the tube comprising a metallic electrode lead and an electrochemically active region, the active region of the reference electrode being in contact with the second electrolyte, a portion of the metallic reference electrode element extending externally of the tube through the tube aperture, a seal closing the aperture around the reference electrode, and a seal closing the opposite end of the tube.

3,957,613

MINIATURE PROBE HAVING MULTIFUNCTIONAL ELECTRODES FOR SENSING IONS AND GASES

Robert A. Macur, Milwaukee, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 1, 1974, Ser. No. 519,793
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—195 M 15 Claims



1. A unitary multifunctional probe for simultaneously determining the quantities of selected ion and gas constituents in a sample, comprising:

a. first electrode means including an elongated member having an electrochemically active first electrode portion for producing a potential in response to and representative of the amount of one of said constituents in said sample when said electrochemically active first electrode portion is in electrochemical communication with said sample,

b. second electrode means having an electrochemically active second electrode portion for producing a second potential in response to and representative of the amount of another of said constituents in said sample, which is different than said one constituent, when said second electrode portion is in electrochemical communication with said sample, said second electrode means being supported from said elongated member, and

c. insulating means interposed between said first and second electrode means for isolating said first and second electrode means from each other,

d. at least one of said electrode means including a reference electrode having an electrochemically active portion in insulating spaced relationship relative to an aforesaid electrochemically active portion, said reference electrode being supported insulatingly from said elongated member and cooperating with at least one of said electrochemically active portion to produce a potential which is representative of a constituent,

e. an electrolyte in mutual contact with said reference electrode active portion and with said active portion of said at least one electrode means, and

f. a diffusion barrier enclosing said electrolyte,

g. said second electrode means including a second reference electrode having an electrochemically active portion in insulating spaced relationship relative to its cooperating one of said electrochemically active portions, said second

reference electrode being supported insulatingly from said elongated member,

h. an electrolyte in mutual contact with said active portion of said second reference electrode and the active portion of its cooperating electrode.

10. A unitary multifunctional probe for enabling simultaneous sensing of hydrogen ions and carbon dioxide and oxygen gases, comprising:

a. a plurality of elongated conductive means having proximal ends providing means for connecting to electrical measuring circuits external to the probe,

b. a plurality of electrode systems comprising adjacent electrodes responsive to selected gases and ions and to combinations thereof, said electrodes being in conductive relation to said elongated conductive means, respectively,

c. one of said systems being responsive to oxygen gas and hydrogen ions and the other of said systems being responsive to carbon dioxide gas,

d. said one system which is responsive to oxygen gas and hydrogen ions comprising a first electrode having an electrochemically active region composed of a metal selected from the group consisting of molybdenum, tantalum and tungsten,

e. a second electrode in said one system in insulated spaced relation to said first electrode, said second electrode having an electrochemically active region composed of silver-silver halide other than fluoride,

f. another of said electrode systems which is responsive to carbon dioxide comprising a third electrode having an electrochemically active region composed of silver-silver halide other than fluoride,

g. a fourth electrode in said another system in insulated spaced relation to said third electrode, said fourth electrode having an electrochemically active region composed of a metal selected from the group consisting of palladium and iridium having the oxide, respectively, of said metal coated thereon,

h. insulating means interposed between said electrode systems,

i. an electrolyte in mutual contact with said first and second electrodes and an oxygen gas and hydrogen ion permeable diffusion barrier encasing said electrolyte and said first and second electrodes,

j. an electrolyte in mutual contact with said third and fourth electrodes and a diffusion barrier at least permeable to carbon dioxide encasing said last named electrolyte and said third and fourth electrodes,

k. said last named barrier means also serving as insulating means extending toward said proximal end,

l. potentials measured externally of said probe between said first and second electrodes indicating the partial pressure of oxygen in said sample, the potential measured from an external electrode, which is in ionic communication with said sample, across said barrier to said second electrode indicating the hydrogen ion level of said sample and the potential measured between said third and fourth electrodes indicating the partial pressure of carbon dioxide in said sample.

3,957,614

APPARATUS FOR TREATING PORTIONS OF ARTICLES

William Joseph Corby, Allentown; Edward Stephen Figuli, Emmaus, and Earl Dallas Winters, Quakertown, all of Pa., assignors to Western Electric Company, Inc. and Bell Telephone Laboratories, Incorporated, both of New York, N.Y.

Division of Ser. No. 426,744, Dec. 20, 1973, Pat. No. 3,894,918. This application May 9, 1975, Ser. No. 576,395

Int. Cl.[2] C25D *17/28;* **B65G** *49/00*

U.S. Cl. 204—224 R **6 Claims**

1. An apparatus for treating a portion of an article, comprising:

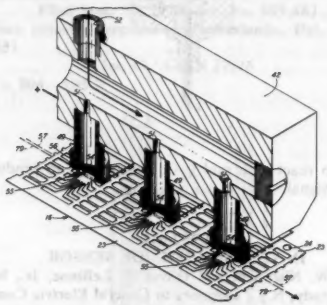
a treating member having an orifice;

means for flowing a treating medium out of the orifice;

a sensing device for producing a control signal;

means for continuously moving the article past the sensing device to produce the control signal and then past and spaced from the orifice and into contact with the treating medium, the movement of the article past the orifice resulting in relative motion between the article, the orifice and the treating medium, such treating medium contacting the portion of the article to be treated and other portions of the article not to be treated; and

means responsive to the control signal for sequentially and electrically rendering effective the treating medium to treat with the medium the portion of the continuously moving article in contact with the medium while the medium is so rendered effective, whereby the remainder of the article is not treated.



3,957,615

APPARATUS FOR CONDUCTING ELECTROLYTIC REACTIONS

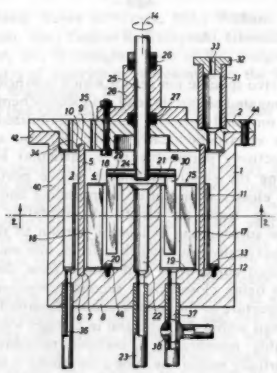
Walter Diefenbacher, Blankenloch; Peter Schlosser, Au am Rhein, and Eduard Schwind, Karlsruhe, all of Germany, assignors to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed Dec. 28, 1973, Ser. No. 429,640

Claims priority, application Germany, Dec. 28, 1972, 2263782

Int. Cl.[2] C22D *1/02*

U.S. Cl. 204—260 **15 Claims**



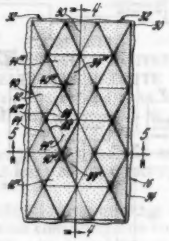
1. Apparatus for conducting electrolytic reactions in an aqueous solution comprising:

a. a vessel defining an electrolysis chamber and including a bottom wall;
b. a cover for the vessel;
c. a tubular diaphragm dividing the vessel into a cathode chamber extending inwardly from the diaphragm and an anode chamber extending outwardly from the diaphragm;
d. a tubular anode positioned in the anode chamber;
e. a cathode positioned in the cathode chamber, said cathode comprising a plurality of angularly spaced sheets positioned about a center axis common to the anode and diaphragm; and
f. an overflow in the cathode chamber for the aqueous solution, said overflow comprising a stem extending upwardly from the bottom wall and having an internal bore which communicates with a discharge opening in the bottom wall.

3,957,616
REFLEX REFLECTOR

James R. Montgomery, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 400,241, Sept. 24, 1973, Pat. No. 3,851,947. This application Oct. 10, 1974, Ser. No. 513,697
Int. Cl.² C25D *1/00*; B29D *11/00*
U.S. Cl. 204—281 **2 Claims**



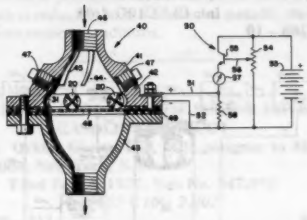
1. A cube corner reflex pin comprising: a rectangular body having a long side, and a pair of parallel short walls, said body further including a longitudinal V-shaped groove having diagonal walls formed therein extending outwardly from its centroidal axis, three mutually perpendicular faces formed at one end of said body and intersecting at said centroidal axis, one of said faces having diagonal edges and being oppositely disposed from said V-shaped groove and being defined by an area bounded by the long side and said diagonal edges extending between the axis and the ends of said long side, the other faces being symmetrically disposed with respect to the groove and said one of said faces, said other faces being defined by the areas bounded by the short sides, said diagonal edges and said diagonal walls extending between the axis and intersecting the ends of the short sides.

3,957,617
WATER TREATMENT DEVICE WITH TRANSISTORIZED CIRCUIT

Henry S. Aber, Cleveland; Dean D. Riggs, Avon Lake, and John Lamantia, Lakewood, all of Ohio, assignors to Water Technology Service, Inc., Cleveland, Ohio

Division of Ser. No. 356,600, May 2, 1973, Pat. No. 3,899,410. This application May 22, 1975, Ser. No. 579,771
Int. Cl.² B01D *13/02*
U.S. Cl. 204—305 **3 Claims**

1. A fluid treatment apparatus comprising a fitting having inlet and outlet passages for coupling in a flow line, said fitting defining an electrically conductive bell-shape housing having inlet and outlet chambers and a perforated electrically conductive screen insulatively supported between said chambers for separating the same, means for applying an electric potential between said electrically conductive bell-shape housing and said perforated electrically conductive screen, said means for applying an electric potential comprising energy storage means for providing a source of said electric potential, said energy storage means having first and second terminals, a potentiometer coupled across said first and second terminals, said potentiometer having an adjustable output terminal, a

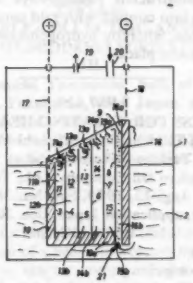


series circuit including a transistor, meter, and resistor means coupled across said first and second terminals, said transistor having a base coupled to said adjustable output terminal of said potentiometer, and means for coupling opposite sides of said resistor means respectively to said perforated electrically conductive screen and said electrically conductive bell-shape housing.

3,957,618
WATER DECOMPOSITION APPARATUS FOR PRODUCING DETONATING GAS

Ernst Spirig, Movenstrasse 37, Rapperswil, Switzerland

Filed Aug. 7, 1974, Ser. No. 495,310
Claims priority, application Switzerland, Aug. 22, 1973, 12090/73
Int. Cl.² C25B *1/02*, *1/04*
U.S. Cl. 204—270 **3 Claims**



1. A water decomposition apparatus for producing detonating gas, comprising a plurality of electrolysis cells open at the top and provided with electrodes, each cell being equipped at the top thereof with a mouth located at different elevations and communicating with the next adjacent lower situated cell to permit the flow of liquid therein contained from one to the next, a common housing for said electrodes formed of insulating material, open at the top, and containing said electrodes, and a tank defining a further compartment for receiving said common housing and said electrodes, said further compartment containing an electrolyte, the highest cell with the highest situated mouth communicating with a lower portion of said further compartment by means of an opening provided in the floor of said highest cell.

3,957,619

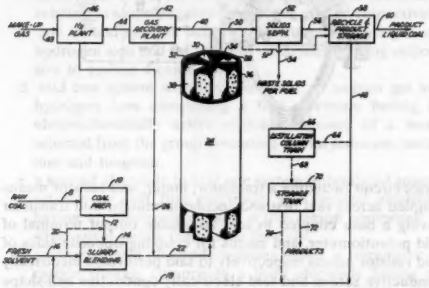
PROCESS FOR THE CONVERSION OF CARBONACEOUS MATERIALS

Sun W. Chun, Murrysville; Donald C. Cronauer, Gibsonia, and Thomas W. Leslie, Blawnox, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 441,604, Feb. 11, 1974, abandoned, which is a division of Ser. No. 226,503, Feb. 15, 1972, abandoned. This application June 24, 1974, Ser. No. 482,077

Int. Cl.² C10G *1/06*

U.S. Cl. 208—10 **29 Claims**



1. A process for the conversion of solid carbonaceous materials containing less than about 50 weight per cent of solid inorganic compounds, which carbonaceous materials tend to produce coke during conversion, which comprises introducing a slurry composed of said solid carbonaceous material and a solvent having hydrogen transfer properties together with hydrogen into a reaction vessel comprising a plurality of closely-spaced reaction zones separated by porous partitions, a portion of said zones containing a solid particulate catalyst which will not pass through said porous partitions and the remainder of said zones forming substantially unobstructed passageways through said reaction vessel and passing slurry through said unobstructed passageways and through said porous partitions into contact with said catalyst under hydrogenation conditions, whereby hydrogenation of said carbonaceous materials takes place.

3,957,620

PROCESS FOR TREATING HEAVY OIL

Yukimasa Fukui; Teikichi Hosoi; Hisashi Makita; Heihachiro Mukaida, and Toshiro Takahashi, all of Yokkaichi, Japan, assignors to Daikyo Oil Company Ltd., Tokyo, Japan

Filed Aug. 13, 1973, Ser. No. 387,551

Claims priority, application Japan, Dec. 30, 1972, 48-2366

Int. Cl.² C10G *9/02*

U.S. Cl. 208—46 **1 Claim**

1. A process comprising:

a. heating a sulfur-containing, heavy hydrocarbon oil containing at least one alkali metal carbonate, in a cracking zone at a temperature of about 450° to 650° and for a time sufficient to produce a gaseous hydrocarbon product and a light hydrocarbon liquid product and convert a substantial portion of the sulfur contained in said heavy hydrocarbon oil to alkali metal sulfide, while maintaining said alkali metal carbonate and said heavy hydrocarbon oil at a weight ratio sufficient to produce a residual coke by-product containing alkali metal carbonate, coke and alkali metal sulfide and having a weight ratio of alkali metal carbonate to coke of at least about 3 to 1,

b. withdrawing said gaseous hydrocarbon product, said hydrocarbon liquid product and said residual coke by-product from said cracking zone,

c. transferring said residual coke by-product to a separate gasification zone,

d. contacting said residual coke by-product with steam in said gasification zone, at a temperature of about 550° to 800°C and under a pressure of about 1 to 10 atmospheres, to gasify at least a portion of said coke and product a H_2— and CO_2—rich gas, while maintaining said residual coke by-product in said gasification zone for a time sufficient to react said stream and said CO_2 with said alkali metal sulfide to convert a substantial portion thereof to alkali metal carbonate and produce a gaseous product and a residual alkali metal carbonate product,

e. withdrawing said gaseous product and said residual alkali metal carbonate from said gasification zone, and

f. recycling at least a part of said residual alkali metal carbonate to said cracking zone.

3,957,621

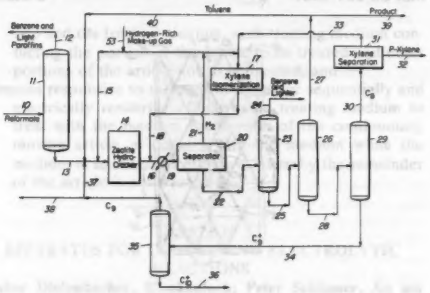
PRODUCTION OF ALKYL AROMATIC HYDROCARBONS

John C. Bonacci, Cherry Hill, and Ronald P. Billings, Clementon, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 479,930, June 17, 1974. This application Jan. 30, 1975, Ser. No. 545,645

Int. Cl.² C07G *3/10*; **C10G** *37/10*

U.S. Cl. 208—60 **6 Claims**



1. An improved method for producing aromatic hydrocarbons from a hydrocarbon charge containing aromatic hydrocarbons including benzene and C_8 alkyl aromatics and aliphatic hydrocarbons which charge is rich in such aromatic hydrocarbons and lean in aliphatic hydrocarbons boiling above about 220°F. by reason of conversion under severe conditions which comprises subjecting said charge to distillation conditions of temperature and pressure such that at least a portion of the benzene content of said fraction is separated as vapor from an alkyl aromatic fraction containing aliphatic hydrocarbons and the major portion of C_8 aromatics in said charge, reacting said alkyl aromatic fraction in the presence of hydrogen in contact with a catalyst containing type ZSM-5 zeolite, zeolite ZSM-12, zeolite ZSM-21 or zeolite beta in combination with a hydrogenation/dehydrogenation component at conversion conditions to convert aliphatic hydrocarbons to lower boiling material of five carbon atoms and lighter separable from aromatics by distillation including a temperature of about 500° to 1000°F., a pressure of about 100 to about 600 pounds, a hydrogen to hydrocarbon mol ratio of 0.2 to 8 and weight hourly space velocity of 0.5 to 15, concurrently contacting a mixture of hydrogen and toluene with a disproportionation catalyst under reaction conditions to disproportionate said toluene, combining the effluents of said contacting steps, separating hydrogen from the combined effluents of said contacting steps, separating hydrogen from the combined effluents, recycling at least a portion of said separated hydrogen to said contacting steps, distilling the hydrocarbon residue from said separation step to recover therefrom at least toluene and mixed xylenes, and recycling at least a portion of said recovered toluene as feed to the disproportionation step aforesaid.

3,957,622

TWO-STAGE HYDROCONVERSION OF HYDROCARBONACEOUS BLACK OIL

John G. Gatsis, Des Plaines, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 5, 1974, Ser. No. 495,686
Int. Cl.² C10G 23/02
U.S. Cl. 208—89 4 Claims

1. A process for the desulfurization and hydrocracking of a heavy hydrocarbon oil containing sulfur and asphaltenes, which comprises reacting said oil with hydrogen in a first reaction stage to desulfurize said oil, reacting the effluent from said first stage in a second reaction stage to hydrocrack and desulfurize the oil further, said first and said second reaction stages being carried out in contact with a supported catalyst composite comprising a metal from Group VI-B and a metal from Group VIII of the Periodic Table with alumina containing from about 10.0 percent to about 90.0 percent by weight of silica, said catalyst composite being characterized by having a macropore volume consisting of pores having pore diameters in the range of 117 to 58,000 Angstroms, less than 50 percent of the macropore volume of said catalyst in said first stage being characterized by pores having pore diameters greater than about 1000 Angstroms and more than 50 percent of the macropore volume of the catalyst in said second stage being characterized by pores having pore diameters greater than about 1000 Angstroms.

3,957,623

STABLE, CATALYTICALLY ACTIVE AND COKE SELECTIVE ZEOLITE

Carl Vance McDaniel, Laurel, and John Storey Magee, Jr., Cooksville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Apr. 24, 1974, Ser. No. 463,611
Int. Cl.² B01J 29/12; C10G 11/02
U.S. Cl. 208—120 4 Claims

1. A process for the catalytic cracking of a hydrocarbon charge which comprises contacting said charge at a temperture of 800° to 1050°F. with a catalyst comprising a faujasitic crystalline aluminosilicate zeolite having a silica to alumina ratio of 3 to 6 in the stabilized rare earth form, said zeolite being prepared by a process which comprises the steps of:

a. reducing the alkali metal oxide content of a faujasitic crystalline aluminosilicate zeolite to about 2.0 to 5.0 weight percent by ion exchanging with a solution containing a cation which upon thermal decomposition leaves a major portion of the zeolite in the hydrogen form,
b. ion exchanging said zeolite with a solution containing a rare earth salt in a concentration sufficient to impart a rare earth oxide content of about 0.1 to 6.0 percent by weight of the zeolite,
c. drying, calcining said exchanged zeolite at a temperature of from about 700° to 1650°F. for about 0.1 to 3.0 hours,
d. further exchanging said zeolite with a solution containing rare earth salt to decrease the alkali metal oxide content to below about 1.0 weight percent about 1.0 to 10 percent by weight of the zeolite; and
e. washing, drying and recovering the zeolite product and recovering the cracked hydrocarbon product.

3,957,624

REFORMING WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Jan. 2, 1975, Ser. No. 538,240
Int. Cl.² C10G 35/08
U.S. Cl. 208—139 18 Claims

1. A reforming process which comprises contacting a gasoline fraction at reforming conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.5 to about 5 wt. % cobalt, about 0.01 to about 5 wt % germanium, and about 0.1 to about 3.5 wt. % halogen, wherein the platinum group metal, cobalt, and germanium are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state, wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal, and wherein substantially all of the cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under reforming conversion conditions.

3,957,625

METHOD FOR REDUCING THE SULFUR LEVEL OF GASOLINE PRODUCT

Bernard A. Orkin, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 7, 1975, Ser. No. 547,892
Int. Cl.² C10G 23/02
U.S. Cl. 208—211 4 Claims

1. A method for reducing the sulfur content of a gasoline product derived from a cracking step which comprises;

a. fractionating said gasoline product at a cut point in the range of 180°–300°F to recover a high boiling portion thereof which includes undesired high levels of combined sulfur from a lower boiling olefin-rich gasoline fraction,
b. contacting said high boiling portion of said gasoline product with a cobalt-molybdenum-alumina desulfurizing catalyst including a promoter selected from the group consisting of barium, magnesium, cadmium, and a rare earth under reaction conditions of temperature, pressure, and space velocity to effect desulfurizing thereof without substantially reducing the olefin content of the desulfurized product and
c. blending the desulfurized product of step (b) with the remaining lower boiling olefin-rich portion of the gasoline product of step (a) to produce a desulfurized gasoline desired low sulfur content and high octane rating.

3,957,626

MULTIPLE BUBBLE-COLLECTING ANNULAR PLATES IN A FLUIDIZED HYDRODESULFURIZATION OF HEAVY OIL

Junichi Kubo; Genichi Yamamoto, both of Kawasaki, and Hideki Sakuma, Yokohama, all of Japan, assignors to Nippon Oil Company Ltd., Tokyo, Japan

Filed Nov. 11, 1974, Ser. No. 522,717
Claims priority, application Japan, Nov. 13, 1973, 48-126797
Int. Cl.² C10G 23/02
U.S. Cl. 208—213 1 Claim

1. In a process for the prevention of catalyst efflux in the hydrodesulfurization of a heavy petroleum hydrocarbon oil in a hydrodesulfurizing reactor composed of a cylindrical pressure vessel accommodating therein a coaxially positioned cylindrical inner pipe, by the steps comprising:

a. feeding hydrodesulfurization catalyst particles into the hydrodesulfurizing reactor,
b. introducing heavy petroleum hydrocarbon oil and hydrogen-containing gas into the reactor at the lower part of said inner pipe to substantially fluidize the hydrodesulfurization catalyst particles in said inner pipe,
c. upflowing the mixture of said oil, hydrogen-containing gas, and catalyst particles in said inner pipe, while performing the hydrodesulfurization reaction,
d. overflowing a reaction mixture from the top of said inner pipe into an upper catalyst-separating zone positioned inside the pressure vessel adjacent to the upper part of said inner pipe, wherein the hydrodesulfurization catalyst separates from the gas-liquid mixture due to the decrease in linear flow rate of the reaction mixture caused by the

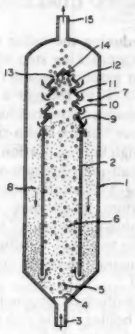
greater cross-sectional area of the catalyst-separating zone than that of said inner pipe,

e. settling the hydrodesulfurization catalyst separated in said catalyst-separating zone, into a lower catalyst-settling zone defined by the cylindrical wall of said pressure vessel and the wall of said inner pipe,

f. upflowing again the settled hydrodesulfurization catalyst from said lower catalyst-settling zone into said lower part of said inner pipe in a substantially fluidized form, by the action of continuously supplied heavy petroleum hydrocarbon oil and hydrogen-containing gas from the bottom of said inner pipe, and

g. withdrawing from the upper portion of said catalyst-separating zone the mixture of the hydrogen-containing gas and the desulfurized heavy oil from which the catalyst particles have been separated in said catalyst-separating zone; the improvement comprising:

h. providing at least two frusto-conical, downwardly-diverging, bubble-collecting annular plates on the perpendicular central axis of said catalyst-separating zone, said annular plates being arranged on said perpendicular central axis so that the larger diameter thereof is positioned downwardly, said larger diameter of the lowermost annular plate above said inner pipe being at least equal to the diameter of said inner pipe and the larger diameter of said annular plates positioned above said lowermost plate being progressively smaller in size than said larger diameter of said lowermost annular plate, and



i. a catalyst particle-catching plate positioned above said bubble-collecting plates, said catalyst particle-catching plate being conical in shape and being arranged on said perpendicular central axis, the apex thereof being positioned upwardly and the conical surface thereof having openings communicating with the upper portion of said catalyst-separating zone, whereby catalyst particles entrained by gas bubbles in said catalyst-separating zone are prevented from rising above said conical apex, thus preventing catalyst particles from accompanying said desulfurized oil being withdrawn from said vessel.

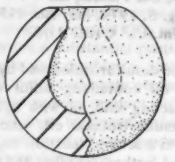
3,957,627

HYDROTREATING HYDROCARBON FEEDS USING AMPHORA-SHAPED CATALYSTS

Daniel R. Herrington, Bedford Heights, and Albert P. Schwerko, Solon, both of Ohio, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Filed Feb. 18, 1975, Ser. No. 550,251
Int. Cl.² C10G *23/02*
U.S. Cl. 208—216 **9 Claims**

1. In the process of hydrotreating a hydrocarbon feed stock containing compounds with carbon-sulfur bonds, carbon-nitrogen bonds and carbon-oxygen bonds by contacting the hydrocarbon feed stock with hydrogen at an elevated temperature and with a hydrotreating catalyst to remove sulfur, nitrogen and oxygen from the hydrocarbon feed stock, the improvement comprising,



using as at least part of said catalyst an amphora catalyst having a substantially spherical shape, a void center therein and an opening on the external surface of said catalyst communicating with said void center.

3,957,628

REMOVAL OF ORGANIC SULFUR COMPOUNDS FROM HYDROCARBON FEEDSTOCKS

Michael Siskin, Maplewood, and Joseph J. Porcelli, Scotch Plains, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 30, 1974, Ser. No. 537,068
Int. Cl.² C10G *17/04*
U.S. Cl. 208—223 **17 Claims**

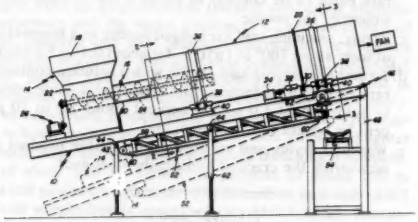
1. A process for the removal of sulfur compounds from a hydrocarbon feedstock which comprises contacting said feedstock in a reaction zone with hydrogen and with hydrogen fluoride, at least a portion of the hydrogen fluoride being in the liquid phase at a temperature above the melting point of hydrogen fluoride and below the critical temperature of said hydrogen fluoride, and separating a hydrocarbon substantially free of sulfur compounds from said hydrogen fluoride.

3,957,629

ADJUSTABLE AIR CLASSIFIER DRUM AND CONVEYOR

Malcolm M. Paterson, Atkinson, N.H., assignor to Raytheon Company, Lexington, Mass.

Filed May 22, 1975, Ser. No. 580,104
Int. Cl.² B07B *4/06*
U.S. Cl. 209—136 **7 Claims**

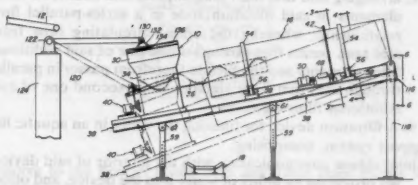


1. A rotary drum classifier means for separating materials comprising a base, a cylindrical open-ended drum mounted for rotation on said base and extending longitudinally thereof, the base and drum being vertically movable as a unit about an axis located at one end thereof, and a conveyor carried by the base and movable therewith, the conveyor having one end projecting beyond the end of the drum opposite said axis to collect material dropping out of the adjacent end of the drum.

3,957,630
ADJUSTABLE MATERIALS FEEDING APPARATUS

Albert H. Mooradian, Winchester, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 22, 1975, Ser. No. 580,377
Int. Cl.² B07B 4/06
U.S. Cl. 209—136 8 Claims

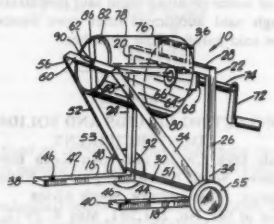


1. A rotary drum classification means for separating materials comprising an elongated vertically adjustable support, a hopper mounted on the support adjacent one end thereof and movable therewith for receiving materials to be classified from a primary conveyor, an open-ended drum rotatably mounted on the support and having one end disposed adjacent the end thereof opposite the hopper, conveying means for transporting materials from said hopper into said drum, pivotal means for supporting the support at the end thereof remote from the hopper, means for raising and lowering the support about the axis of said pivotal means for thereby adjusting the angle of inclination of the drum and consequently moving the hopper in an arcuate path with respect to said primary conveyor, and compensating conveyor means comprising a conveyor section for transporting materials from said primary conveyor to the hopper, connecting means for connecting the adjacent end of said conveyor section to the hopper for movement therewith, said conveyor section being pivotal at its other end beneath the adjacent end of the primary conveyor.

3,957,631
PORTABLE SCREENING APPARATUS

David Santo, Los Angeles, Calif., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Mar. 19, 1975, Ser. No. 559,695
Int. Cl.² B07B 1/22
U.S. Cl. 209—421 5 Claims



1. A portable apparatus for screening a mixture of sand and rocks, which comprises:

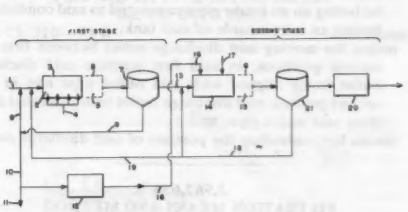
a. a base assembly includng:
1. a pair of L-shaped members, each said member having a vertical and a horizontal arm;
2. each said vertical arm having an upper and a lower end;
3. each said horizontal arm having an outer free end;
4. a first cross bar joined between said upper ends of said vertical arms of said L-shaped members;
5. a second cross bar joined between said lower ends of said vertical arms;
6. a pair of elongated bars affixed onto said lower ends of said vertical arms, said elongated bars extending upwardly in a forward directon at an acute angle relative to said horizontal arms;
7. each said elongated bar having an upper end; and
8. a cross bar member communicating between the upper free ends of said elongated bars, said cross bar member having a central transverse hole therethrough;

b. a block member having a central bore therethrough mounted onto a bottom face of said first cross bar;
c. a bearing assembly contained in said bore;
d. a short shaft journaled through said bearing assembly;
e. a handle assembly pivotally mounted onto an outer end of said shaft;
f. a drum having an annular sidewall, a top cover, and a bottom base, said top cover detachably secured to said sidewall;
g. a bracket member mounted onto an outside surface of said bottom base of said drum;
h. a forward end of said shaft rotatably mounted into said bracket member;
i. means for joining said top cover of said drum to said cross bar member;
j. said annular sidewall having a pluraity of openings therethrough; and
k. a frusto-conical shaped screen member contained within said drum.

3,957,632
WASTE-WATER PURIFICATION

Paul V. Knopp, Wausau, and Wayne B. Gitchel, Rothschild, both of Wis., assignors to Sterling Drug Inc., New York, N.Y.

Filed Mar. 24, 1972, Ser. No. 237,894
Int. Cl.² C02C 1/06, 5/10
U.S. Cl. 210—5 6 Claims



1. The process of simultaneous removal of organic carbonaceous material and biological oxidation of the reduced nitrogenous forms in waste-waters followed by subsequent reduction of the oxidized nitrogen to elemental nitrogen which comprises the steps of:

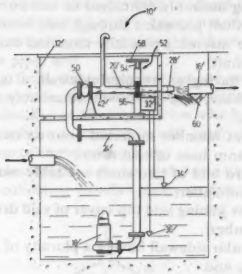
a. feeding waste-water containing ammoniacal nitrogen into a vessel containing a developing active biomass having a sludge age of at least about three days to which vessel is introduced an aqueous suspension of powdered activated carbon simultaneously with the addition of a non-condensible oxygen containing gas;
b. maintaining aerobic conditions for at least one hour to substantially oxidize ammoniacal nitrogen to nitrite or nitrate nitrogen;
c. settling and separating the powdered activated carbon, associated adsorbed organic material and biological solids and returning the separated solids to the inlet end;
d. passing the liquid phase from part (c) to an anaerobic zone containing denitrifying organisms to which further powdered activated carbon and a source of organic carbon is added whereby the oxidized nitrogen forms are reduced to elemental nitrogen and solids accumulate;
e. passing the mixture from part (d) to a quiescent zone where the powdered activated carbon and associated organic material are substantially removed from the waste-water; and
f. removing the effluent from the quiescent zone.

3,957,633

SEWAGE TREATMENT METHOD AND APPARATUS

Giuliano Gatti, Milan, Italy, and Hjalmar Fries, Spanga, Sweden, assignors to ITT Industries, Inc., New York, N.Y.

Filed Sept. 19, 1974, Ser. No. 507,404
Int. Cl.² C02C 1/08
U.S. Cl. 210—104 3 Claims



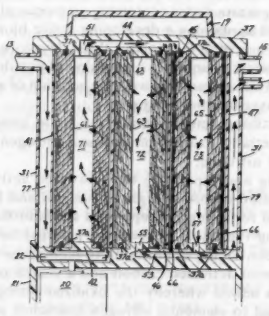
1. An apparatus for treating sewage water comprising:
a tank containing sewage water having an inlet pipe and an outlet pipe;
a pump in said tank having an inlet and an outlet, said inlet being submersed in said sewage water;
a conduit connected at one end to said pump outlet and terminating at its other end in a movable discharge outlet adjacent to but spaced from said tank outlet pipe;
sewage aeration means in said conduit, said aeration means including an air intake pipe connected to said conduit and having an inlet outside of said tank;
means for moving said discharge outlet between first and second positions, in said first position said discharge outlet being aligned with said outlet pipe and in said second position said discharge outlet being directed away from said outlet pipe; and
means for controlling the position of said discharge outlet.

3,957,634

FILTRATION MEANS AND METHOD

Henry E. Orensten, and Vivian C. Orensten, both of 8724 Westmoreland Lane, St. Louis Park, Minn. 55426

Filed May 20, 1974, Ser. No. 471,319
Int. Cl.² B01D 29/24; C02B 5/10
U.S. Cl. 210—11 12 Claims



1. In a method for preventing the build-up of excessive ammonia levels in the water in an aquatic life support tank, wherein the water in the tank is circulated in a circulating flow out of said tank to a filtration zone and back from said filtration zone into said tank, the improvement which comprises the steps of:
a. depositing a microorganism growth medium and establishing a colony of living nitrifying a microorganisms at least on a filtering surface of an essentially integral, solid, porous first filter element,
b. providing a plurality of integral, solid, porous additional filter elements,
c. arranging said first filter element and said additional filter elements in said filtration zone in a series-parallel flow relationship, whereby the entire circulating flow from said tank passes first through a first one of said additional filter elements and the filtrate therefrom passes in parallel through said first filter element and a second one of said additional filter elements.

9. A filtration device for filtering the water in an aquatic life support system, comprising:
inlet means communicating with the interior of said device, for providing an influx of water into the device, and outlet means in communication with the interior of said device, for returning filtered water to said aquatic life support system; said interior of said device containing a plurality of elements comprising:
a. a prefiltration housing defining a prefiltration chamber for housing a filter core element, and prefiltration chamber being in liquid communication with said inlet means;
b. a removable, solid, integral, porous prefiltration filter core element housed within said prefiltration chamber;
c. flow-directing means operably associated with said prefiltration housing for continuously directing said influx of water from said inlet means through said porous prefiltration filtering core element;
d. a parallel flow housing defining a parallel flow chamber for receiving the flow from said prefiltration chamber which has passed through said porous prefiltration filtering core element and for housing a plurality of filter core elements, said parallel flow chamber being in liquid communication with said prefiltration chamber;
e. a plurality of removable, solid, integral, porous additional filter core elements housed within said parallel flow chamber upstream from said outlet means, for further filtering the said prefiltrate; at least one of said additional filter core elements containing, at least on the surface thereof, a colony of nitrifying organisms including bacteria; and
f. flow-directing means operably associated with said parallel flow housing for continuously directing the flow of water received from said prefiltration chamber through said additional filter core elements housed within said parallel flow chamber.

3,957,635

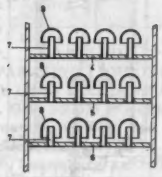
CONTACTING LIQUIDS AND SOLIDS IN COUNTERCURRENT

Francis Louis Dirk Cloete, and Alan Keith Haines, both of Johannesburg, South Africa, assignors to National Institute of Metallurgy, Johannesburg, South Africa

Continuation of Ser. No. 251,201, May 8, 1972, abandoned. This application Jan. 23, 1974, Ser. No. 435,686
Claims priority, application South Africa, May 14, 1971, 71/3139
Int. Cl.² B01D 15/02
U.S. Cl. 210—24 7 Claims

1. In a process in which solids and a liquid are contacted in vertical countercurrent in a series of stages between which liquid and solids can flow in both directions, the solids being introduced into a first stage, the solids flowing from the first stage downwardly to a last stage and out of the last stage, liquid being introduced into the last stage, and the liquid flowing from the last stage upwardly to the first stage and out of the first stage, and the rate of flow being cyclically varied so that during a first part of each cycle the solids are allowed

to settle in the liquid phase, in a second part are caused to pass from one stage to the next, while in a third part of the cycle liquid is caused to flow from the last stage towards the first stage while fluidizing the solids in its path, the improvement comprising restricting the flow of solids from the last stage



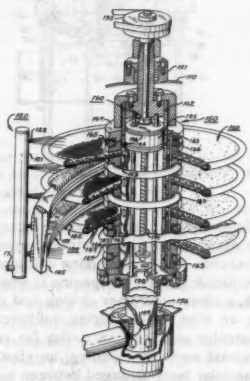
relative to the flow of solids from any other stage during the second part of a cycle so that the volume of solids that is caused to pass out of the last stage is less than the volume of solids that can flow between any pair of stages during the second part of a cycle.

3,957,636

METHOD AND APPAPARATUS FOR LIQUID/SOLID SEPARATION

Kostas Savas Arvanitakis, 14945 S. Dogwood Ave., Orland Park, Ill. 60462

Filed Mar. 6, 1974, Ser. No. 448,493
Int. Cl.[2] B01D *37/00*
U.S. Cl. 210—67 **33 Claims**



13. A method of removing materials from an unclarified liquid and reclaiming the liquid and/or materials comprising the steps of

passing unclarified liquid into a filter chamber and through a plurality of horizontally disposed filter cake bearing filters vertically spaced one from the other thereby removing the materials from the liquid and accumulating the materials on the filter cake,

discharging the liquid clarified thereby from a discharge outlet,

interrupting the passing of unclarified liquid through the filter and the discharging of the clarified liquid in response to accumulating a predetermined amount of material on the filter cake,

pressurizing the filter chamber forcing liquid remaining in the chamber through the filters,

pressure draining liquid through the filters from the filter chamber,

interrupting the pressure draining of liquid from the filter chamber by passing the pressurizing medium through the uppermost filter,

drying the uppermost filter cake by passing the pressurizing medium therethrough,

interrupting the passing of pressurizing medium through the uppermost filter,

re-pressurizing the filter chamber forcing liquid remaining in the chamber through the lower filters,

pressure draining the liquid through the lower filters from the filter chamber,

interrupting the pressure draining of liquid from the filter chamber by passing the pressurizing medium through the adjacent vertically spaced filter,

drying the filter cake of the adjacent vertically spaced filter by passing the pressurizing medium therethrough,

interrupting the passing of the pressurizing medium through said adjacent filter,

pressurizing the filter chamber forcing liquid remaining in the chamber through the remaining lower vertically spaced filters, and

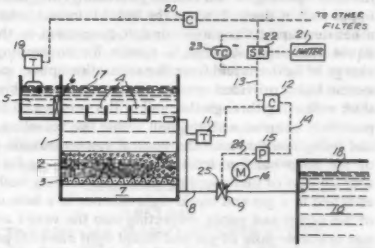
continuing the sequential steps of pressurizing the filter chamber, pressure draining the remaining liquid, interrupting the pressure draining, drying the filter cake and interrupting the passing of the pressurizing medium through the dried filter cake until the filter cake on the lowermost of the vertically spaced filters has been dried.

3,957,637

FILTRATION SYSTEM AND FLOW CONTROL METHOD THEREFOR

Edward F. Morey, Atlanta, Ga., assignor to The Taulman Company, Atlanta, Ga.

Filed Aug. 23, 1974, Ser. No. 500,103
Int. Cl.[2] B01D *23/26*
U.S. Cl. 210—73 R **18 Claims**



1. A system for controlling the flow of a fluid medium through a plurality of filters provided for removing suspended solids from said fluid medium, which comprises:

an inlet conduit common to said plurality of filters for directing said fluid medium thereto;

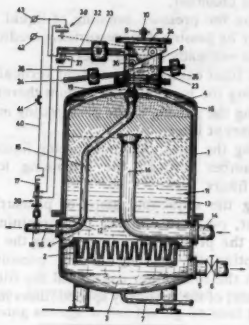
each of said filters having an effluent conduit for receiving filtered fluid medium therefrom, means connected across each of said filters for measuring the differential fluid pressure across each of said filters and for providing an output signal proportional thereto, means for providing a common set point signal for each of said filters indicative of the desired differential fluid pressure across each of said filters, and means responsive to said output signal and said set point signal for varying the differential fluid pressure across each of said filters until the differential pressure across each of said filters corresponds to said desired differential pressure.

3,957,638

APPARATUSES FOR THE SEPARATION OF A LIGHTER LIQUID FROM A MIXTURE OF A HEAVIER AND A LIGHTER LIQUID

Cornelis in't Veld, Vlaardingen, Netherlands, assignor to National Marine Service, Incorporated, St. Louis, Mo.

Filed Nov. 26, 1974, Ser. No. 527,277
Int. Cl.² B01D 21/24
U.S. Cl. 210—104 6 Claims



1. An apparatus for the separation of oil, a heavier liquid and a lighter liquid from a mixture of the same said apparatus comprising at least a vessel, a venting member associated with said vessel, a bell mounted for vertical movement between a lowest and a highest position in said vessel, a filter which is only capable of letting heavier liquid through, said filter dividing the vessel into a chamber containing said bell and a heavier liquid discharge chamber, a conduit for the supply of mixture to be separated, said conduit opening into the space in said bell, said space being the separation space, a lighter liquid discharge conduit connected to said separation space, the inlet opening of said discharge conduit lying just below the upper wall of the bell, when the latter is in its lowest position, a heavier liquid discharge conduit connected to the heavier liquid discharge chamber, a system for controlling the discharge of lighter liquid from the separation space, said control system being provided outside the vessel, a rotatable coupling shaft extending through the wall of the vessel, said shaft being positively coupled with the bell within the vessel on one hand and being coupled with the control system outside the vessel on the other hand, at least one bearing bushing for the rotatable support of said coupling shaft, said bearing bushing being attached in a gas and liquid tight manner in a hole of the wall of the vessel and partly projecting into the vessel and at least one twistable hose of gas and liquid tight material provided in the vessel and surrounding said coupling shaft over a portion of its length, one end of said hose being slipped in a gas and liquid tight manner over said bearing bushing and the other end thereof over a portion of the coupling shaft or over a sleeve provided thereon.

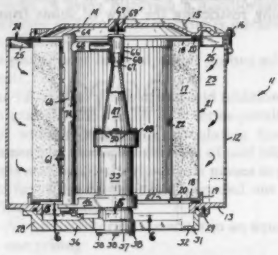
3,957,639

FLUID FLOW MODULATOR

Donald W. Schoen, St. Paul, and James M. Silvernail, Minneapolis, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Jan. 14, 1975, Ser. No. 540,842
Int. Cl.² B01D 46/04
U.S. Cl. 210—107 14 Claims

1. A fluid flow modulator for a manifold having a row of longitudinally aligned slot-like fluid discharge apertures, said modulator comprising a plurality of valve elements each for a different one of said apertures, means yieldingly urging said valve elements toward valve closing relationship with their respective apertures, a cam shaft journaled in said manifold, a plurality of cams on said cam shaft, and a plurality of cam follower portions each operatively associated with a different



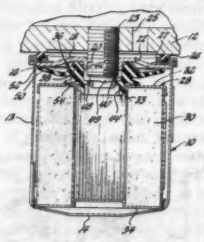
one of said valve elements and each engaging a different one of said cams to open said valve elements in a given succession responsive to rotation of said cam shaft.

3,957,640

LIQUID FILTER

Gary F. Stack, Holly, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 27, 1975, Ser. No. 580,911
Int. Cl.² B01D 21/24
U.S. Cl. 210—117 2 Claims



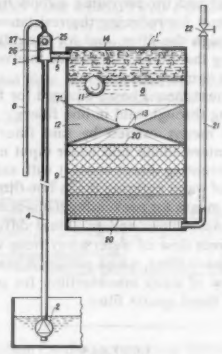
1. A liquid filter assembly comprising a can having a closed end and an open end, a filter cartridge arranged in said can having an exterior side for receiving unfiltered liquid and an interior side forming a central opening to which filtered liquid is delivered, a closure member closing said open end of said can having an inlet for delivering unfiltered liquid to said exterior cartridge side and an outlet for receiving filtered liquid from said cartridge opening, an elastomeric member having an annular body arranged between said closure member and one end of said filter cartridge, said body having a central opening communicating said cartridge opening with said outlet, said body having a flexible annular valve portion normally seating along its outer perimeter on said closure member radially outward of said inlet to prevent liquid in said filter assembly from draining back out said inlet and flexible to lift off said closure member in response to pressure build-up at said inlet to permit flow to said filter cartridge during normal filter flow operation, and said body also having a flexible annular cartridge loading and sealing portion normally extending a predetermined substantial axial distance from said body prior to assembly for engaging said one cartridge end radially outwardly of and about said cartridge opening so that on assembly of said closure member said body is compressively loaded and said cartridge loading and sealing portion flexes in a radially outward direction and transmits and distributes an axial force about and on said one cartridge end to force the other cartridge end against said closed can end while sealing is provided between said inlet and outlet by the com-

pressively loaded body sealingly engaging said closure member over a substantial annular area extending between said inlet and outlet and also by said cartridge loading and sealing portion in the flexed condition sealingly engaging said one cartridge end over a substantial annular area radially outward of said communicating central openings in said body and cartridge.

3,957,641
DEVICE FOR SEPARATING LIQUIDS OF SPECIFICALLY LOWER DENSITY THAN WATER, AND PARTICULARLY OIL, FROM WATER

Peter Jakubek, Brunn am Gebirge, and Karl Biswanger, Vienna, both of Austria, assignors to Fa. Euro Pollution Control Systems, Inc., Luxemburg, Luxemburg

Filed May 14, 1974, Ser. No. 469,894
Claims priority, application Austria, May 16, 1973, 4285/73
Int. Cl.² B01D *35/00*
U.S. Cl. 210—120 **6 Claims**



1. A device for separating a low-density liquid from a high-density liquid in an accumulation of the liquids with filterable contaminents, said device comprising:

a housing forming a settling chamber for receiving the liquids from said accumulation and allowing separation of said liquids into an upper low-density liquid layer and a lower high-density liquid layer;

a liquid-displacement pump disposed wholly below said chamber and having an inlet side communicating with said accumulation, and an outlet side;

an upwardly extending conduit outside said housing connecting said outlet side of said pump with the top of said chamber for delivering liquids from said accumulation thereto upon operation of said pump;

a vent valve outside said housing connected to said conduit at the uppermost portion thereof and having a gas outlet opening outside said housing, and a liquid-displaceable element for blocking said outlet only upon a rise of liquid in said conduit to said uppermost portion, said element being gravitationally biased away from said gas outlet in the absence of such liquid rise;

a downwardly converging partition extending across said housing defining a funnel-shaped outlet formed at the bottom of said chamber in said housing;

a blocking member dimensioned to float at the interface between the liquids in said chamber and receivable in said funnel-shaped outlet to close the same;

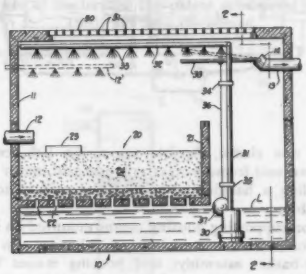
a filter compartment in said housing communicating with said funnel-shaped outlet and having a filter mass in said filter compartment; and

a discharge conduit leading from said filter compartment and extending upwardly to a level at least equal to that of said uppermost portion for discharging the high-density liquid after filtering same through said mass.

3,957,642
PIVOTABLE FLUID DIVERTER FOR RECIRCULATION SYSTEM

Robert R. Oldham, and John H. Wooddell, both of Sidney, Ohio, assignors to Robert R. Oldham, Inc., Sidney, Ohio

Continuation-in-part of Ser. No. 351,273, April 16, 1973, Pat. No. 3,789,986. This application Oct. 29, 1973, Ser. No. 410,613
The portion of the term of this patent subsequent to Feb. 5, 1991, has been disclaimed.
Int. Cl.² B01D *23/16*
U.S. Cl. 210—121 **10 Claims**



1. A fluid diverter for maintaining the level of liquid at a predetermined level in a reservoir having (a) inlet means, (b) outlet means disposed above said predetermined liquid level by which liquid exits from said reservoir, (c) means in said reservoir for treating the liquid, and (d) a system for recirculating said liquid through said treatment means, said fluid diverter comprising diverter means for selectively directing the flow of a portion of said liquid being recirculated in said reservoir recirculating system through said outlet means, and means responsive to the level of liquid in said reservoir for controlling said diverter means to control the flow of at least a portion of said liquid being recirculated in said reservoir recirculation system, said diverter means causing flow of at least a portion of said liquid being recirculated in said reservoir recirculation system through said outlet means when said liquid level is greater than said predetermined level.

3,957,643
CENTRIFUGAL MOISTURE EXTRACTOR

Frederick W. Belz, 3824 Gordon Ave., and Albert B. Crabb, Jr., 2421 8th Ave., both of Fort Worth, Tex. 76110

Filed Aug. 12, 1974, Ser. No. 496,570
Int. Cl.² B01D *33/06*
U.S. Cl. 210—149 **20 Claims**

1. In a centifugal extractor

a motor-basket assembly comprising an electric drive motor, having a motor housing and a drive shaft projecting from said housing, and an open ended extractor basket rigidly and non-rotatably coupled to said shaft with its open end facing away from said motor;

a support frame for supporting said assembly, including at least one hanger arm;

at least one elastic, flexible suspension link, connected between said frame hanger arm and said motor housing, providing a hanging suspension for said motor-basket assembly;

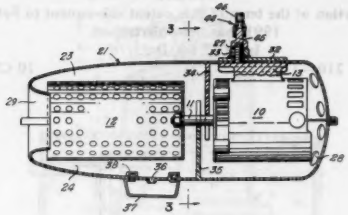
and a non-supporting housing means mounted on said motor housing, and enclosing said motor-basket assembly; said housing means having a loading port; said assembly and said housing means being disposed, relative to each

other, to position the basket open end adjacent to said loading port.

15. In a centrifugal extractor

a motor-basket assembly comprising an electric drive motor, having a motor housing and a drive shaft projecting from said housing, and an open ended extractor basket rigidly and non-rotatably coupled to said shaft with its open end facing away from said motor;

a support frame for supporting said assembly, including a base and at least one hanger arm;



at least one elastic, flexible suspension link, connected between said frame hanger arm and said motor housing, providing a hanging suspension for said motor-basket assembly;

and a non-supporting housing means mounted on said support frame base, and enclosing said hanger arm and said motor-basket assembly; said housing means having a loading port; said assembly and said housing means being disposed, relative to each other, to position the basket open end adjacent to said loading port.

3,957,644

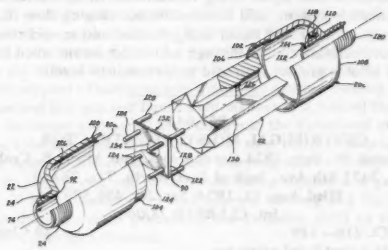
IN-LINE FILTERING DEVICE

Lawrence Aldean Edmonson, Phoenix, Ariz., assignor to Lawrence Aldean Edmonson, Garden Grove, Calif.

Continuation-in-part of Ser. No. 325,609, Jan. 22, 1973, abandoned. This application Jan. 2, 1974, Ser. No. 429,962

Int. Cl.² B01D *29/00, 35/16;* **E04H** *3/20*

U.S. Cl. 210—169 **12 Claims**



1. In a pressurized water system for a pool cleaning system operating at substantially 40 pounds pressure, and having a primary filter unit employing a filtering substance selected from the group of sand diatomaceous earth, and which primary filter unit allows minute portions of its filtering substance to escape into the return line for the pool, and a pool cleaning system responsive to the pressurized water for cleaning the pool and having intricate pressurized water responsive plastic mechanical parts subject to malfunction when the filtering substance is trapped in the pressurized water responsive plastic mechanical parts, and which cleaning system is designed for use with a minimum predetermined water pressure, an in-line filter adapted to be placed intermediate the primary filter unit and the pressurized water responsive plastic mechanical parts for removing said filtering substance without a drop in pressure below said predetermined water pressure, said in-line filter unit comprising:

a housing member of annular shape defining a central bore and having an input end and an output end and having an inner surface;

an input end cap assembly in mating water-tight attachment with said input end of said member and carrying water input means for attaching to one point in the pressurized water system;

an output end cap assembly in mating water-tight attachment to said output end of said member and carrying a water output means for attaching to a second point of the pressurized water system and also carrying fused quartz filter element means located within said housing for filtering the fluid flowing in said system for removing the filtering substance inadvertently escaping from the primary filter;

said filter element being in spaced relationship at least over a portion of its length from said inner surface of said housing for providing a surface for contacting the water to be filtered and for providing a fluid to filter surface area of contact for reducing the resistance to the water flowing through the filter, and for providing a chamber for collecting the filtering substance inadvertently escaping from the primary filter;

said filter element means being adapted for filtering all the water passing through said in-line filter;

Fluid diffuser means carried by said filter element and positioned intermediate said water input means and said filter for preventing direct contact with said filter by the direct flow of water entering the in-line filter through said water input means for preventing damage to said filter by said direct water flow, and said fluid diffuser means diverts the direct flow of water away from that portion of said fused quartz filter, which portion is positioned in-line with the flow of water into the filter for preventing erosion of said fused quartz filter.

3,957,645

FILTER PLATE FOR FILTER PRESS

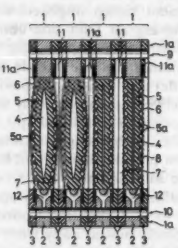
Kenichiro Kurita, Sulta; Tetsuya Kurita, Takarazuka, and Hachiro Yamaji, Osaka, all of Japan, assignors to Kurita Machinery Manufacturing Co. Ltd., Osaka, Japan

Filed Dec. 10, 1974, Ser. No. 531,334

Claims priority, application Japan, Dec. 21, 1973, 48-2060

Int. Cl.² B01D *25/12*

U.S. Cl. 210—231 **4 Claims**



1. A filter plate assembly for a filter press comprising:

a rigid frame with spaced, opposed first and second peripheral faces surrounding a cavity defined within said frame;

filter medium sheets in sealing relationship with each first and second peripheral face of said rigid frame;

elastic frame means at the opposed peripheral faces and supporting the respective filter sheets at peripheral edges thereof and providing sealing means sealing said filter sheet edges to said first and second frame faces;

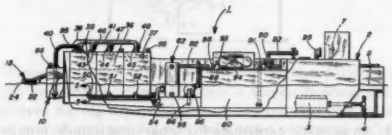
and an expansible-and-contractable, resilient bag including an inlet opening therein located within the cavity defined by the frame, said bag including a plurality of pyramidal projections on opposed outer surfaces of said bag adjacent the filter medium sheets so that said projections provide support means for the filter medium sheets supported by said opposed first and second peripheral frame faces, prefilt inlet means in said frame in fluid communication with the outer surface of each opposed filter medium sheet, filtrate outlet means in said frame in fluid communication with the inner surface of each filter medium sheet supported by said pyramidal projections, fluid-pressure inlet means in said frame in communication with said bag inlet opening so that fluid pressure introduced into said bag through said bag inlet opening expands said resilient bag toward said filter medium sheets at each opposed surface of said bag whereby clogging of the filter plate assembly is substantially eliminated.

3,957,646

INSTALLATION FOR REMOVING POLLUTANTS FROM WATERWAYS

Forrest M. Wickert, 1224 Argyle Drive, North Madison, Ohio 44057

Filed Sept. 6, 1974, Ser. No. 503,729
Int. Cl.² E02B *15/04*
U.S. Cl. 210—242 S **34 Claims**



1. An installation for the removal and recovery of pollutants from waterways, comprising

a main vessel adapted for movement on the surface of the waterway,

a receiving tank supported by said vessel being movable relative to the surface of said waterway and to said vessel and adapted to collect pollutant therein,

a scoop assembly mounted on and projecting outwardly in one direction from said receiving tank and having an inner end connected in fluid communication with said receiving tank and an outer end adapted to be disposed below the surface of the waterway for scooping the pollutant from the surface of the waterway and directing it into said receiving tank along with any water collected therewith,

a primary separation unit on said vessel for separating, by gravity, said pollutant from the water collected from the waterway,

a first transfer assembly connecting said primary separation unit in fluid communication with said receiving tank for transferring said pollutant from said receiving tank to said primary separation unit,

a secondary separation unit on said vessel,

a second transfer assembly connecting said primary separation unit in fluid communication with said secondary separation unit for transferring the separated pollutant from said primary separation unit to said secondary separation unit,

said secondary separation unit includes means for mechanically separating the remaining water from said separated pollutant to provide a still purer pollutant,

a third transfer assembly connected in fluid communication with said secondary separation unit for receiving said purer pollutant and being adapted for connection to a storage facility to enable storage of said purer pollutant for subsequent use thereof,

said scoop assembly includes an upwardly inclined ramp portion for directing the collected pollutant and water into said receiving tank whereby the pollutant is forced up the ramp portion into said receiving tank upon movement of said vessel generally in said one direction, and

said receiving tank supported by said vessel for independent floating movement in said waterway and relative to said vessel.

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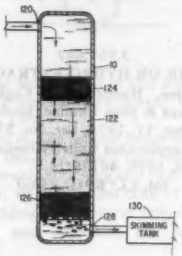
REMOVING OIL FROM WASTE WATER WITH SULFUR

Loyd W. Jones, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Division of Ser. No. 80,424, Oct. 13, 1970, Pat. No. 3,853,753.
This application Sept. 3, 1974, Ser. No. 502,710
The portion of the term of this patent subsequent to Oct. 29, 1991, has been disclaimed.
Int. Cl.² B01D *17/04*
U.S. Cl. 210—265 **10 Claims**



1. An oil-water separator system for separating dispersed oil from water which comprises:

an oily-water source;

a vessel having an oily water inlet and an outlet;

means connecting said oily water inlet to said oily water source;

a bed of granular media within said vessel between said oily water inlet and said outlet having a large total surface area of solid phase sulfur.

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APPARATUS FOR THE FRACTIONATION OF FLUIDS

Jean Roget, Lyon; Michel Salmon, and Bernard Vogt, both of Rhone, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Jan. 18, 1974, Ser. No. 434,652
Claims priority, application France, Jan. 18, 1973, 73.01736
Int. Cl.² B01D *31/00*
U.S. Cl. 210—321 R **22 Claims**

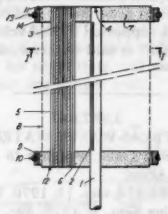
1. A unit element for use especially in fluid fractionating apparatuses, said unit element comprising, in combination:

a. at least one band which is leakproof to the fluid to be treated and which is wound up in the form of a spiral cylinder, the turns of this spiral being radially spaced from one another;

b. a multiplicity of hollow fibers, the majority of which are placed inside the spiral cylinder between its turns;

c. two end walls substantially perpendicular to the axis of the spiral cylinder located one at each end of the cylinder each of the two walls being firmly fixed to the leakproof band, and to the hollow fibres, at least some of the hollow fibres crossing right through at least one of the end walls and opening on the side of said at least one end wall outside the spiral cylinder; and

d. means defining an opening in at least one of the end walls to open into the interior of the innermost turn of the



spiral, whereby the flow of fluid on the exterior of the hollow fibres is exclusively in a spiral direction.

3,957,649

WASHER OR HYDRO-EXTRACTORS

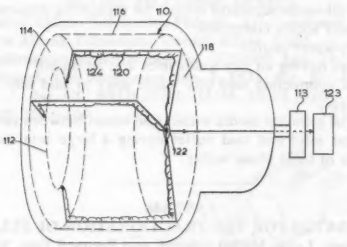
Gordon Leslie Hine, Huddersfield, England, assignor to Thomas Broadbent & Sons Limited, Huddersfield, England

Filed Dec. 11, 1974, Ser. No. 531,841

Claims priority, application United Kingdom, Dec. 12, 1973, 57512/73; Sept. 14, 1974, 40138/74

Int. Cl.² B01D *33/00*

U.S. Cl. 210—376 **9 Claims**



1. A fluid extractor comprising a cylindrical basket having a base, generally cylindrical walls and a mouth opening opposite said base, means mounting said basket for rotation about its longitudinal axis for centrifugally extracting fluid from material placed therein, at least one elongated first flexible member having one end attached to said basket adjacent said mouth and having its other end extending out of said basket through an aperture in the central region of said base, a stripper actuating mechanism located externally of said basket and operably connected to said other end of said first flexible members, said stripper actuated mechanism being selectively operable between a first position permitting said elongated first flexible members to assume a position substantially conforming to the profile of said basket from said mouth to said aperture and a second position applying a tensile load to said first flexible members to withdraw a portion thereof through said aperture to thereby dislodge centrifuged material from the walls of said basket, and means for preventing entanglement of material in the basket with said first flexible members.

3,957,650

ACOUSTIC CENTRIFUGE

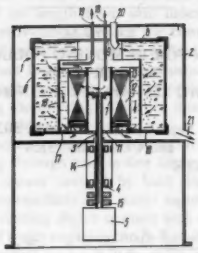
Viktor Dmitrievich Petrushkin, 3 Novo-Ostankinskaya ulitsa, 23, kv. 49, Moscow; Vladimir Fedorovich Tarambula, Pakhrinsky proezd, 12, kv. 92, Podolsk Moskovskoi oblasti; Anatoly Antonovich Nesterovich, Pogonny proezd, 40, kv. 104, Moscow; Boris Georgievich Novitsky, Dubninskaya ulitsa, 45, kv. 30, Moscow; Viktor Mironovich Fridman, Karetny Ryad, 5/10, kv. 180, Noscow, and Dmitry Evseevich Shkoropad, Novo-Alexeevskaya ulitsa, 4, korpus 3, kv. 82, Moscow, all of U.S.S.R.

Filed Mar. 22, 1974, Ser. No. 454,015

Claims priority, application U.S.S.R., Mar. 27, 1973, 1893107

Int. Cl.² B01D *35/20*

U.S. Cl. 210—380 R **2 Claims**



1. An acoustic centrifuge for separating liquids, comprising: a drive shaft; a rotor having a drum-shaped housing coaxially mounted on said drive shaft and having inlet and outlet ports in opposite end plates of said housing, in line with said drive shaft; a chamber being formed inside said housing and having a side wall coaxial therewith, which side wall constitutes a filtering partition; and an acoustic transducer mounted on said drive shaft and accommodated in said chamber, an emitting surface of said transducer facing said partition and being coaxial therewith; said chamber communicating only with said outlet port, the diameter of the latter being substantially larger than that of said inlet port, but smaller than that of said emitting surface, resulting in a pressure differential, between a liquid to be separated and a resulting filtrate, across said partition so that said chamber is kept filled up with the filtrate during the operation of the centrifuge, as a consequence of which uniform acoustic contact is established between said emitting surface and said partition, resulting in an effective regeneration of said partition.

3,957,651

MICROPOROUS POLYESTER MEMBRANES AND POLYMER ASSISTED PHASE INVERSION PROCESS FOR THEIR MANUFACTURE

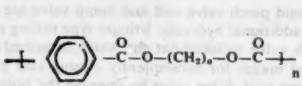
Robert E. Kesting, Irvine, Calif., assignor to Chemical Systems Incorporated, Santa Ana, Calif.

Continuation-in-part of Ser. No. 208,928, Dec. 16, 1971, abandoned, and a continuation-in-part of Ser. No. 347,156, April 4, 1973, abandoned. This application Apr. 30, 1975, Ser. No. 572,887

Int. Cl.² B01D *39/04*; B29D *27/04*

U.S. Cl. 210—490 **17 Claims**

1. An integral microporus membrane having inchoate pores which are at least partially filled with an assisting polymer, the membrane consisting essentially of a polyester resin of the general formula:



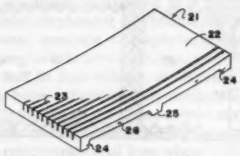
wherein a is an integer of from 3 to 7 and n is an integer greater than about 45, and wherein the assisting polymer is soluble in a solvent which is a nonsolvent for the polyester.

3,957,652

POCKET SCREEN ASSEMBLIES FOR CENTRIFUGAL SEPARATORS AND REPLACEMENT THEREFOR

Ian McGonigal, Winnipeg, Canada, assignor to Delta Precision Casting Co. Ltd., Winnipeg, Canada

Continuation-in-part of Ser. No. 370,813, June 18, 1973, abandoned. This application May 12, 1975, Ser. No. 576,336
Claims priority, application Canada, June 26, 1972, 145627
Int. Cl.² B01D *39/10*
U.S. Cl. 210—498 **5 Claims**



1. A pocket screen assembly for centrifugal separators and the like comprising in combination a screen holding pocket component having a pair of spaced and parallel side walls, a pair of spaced and parallel end walls and a perimetrical flange extending outwardly from the lower edges of said walls, a plurality of screen unit supports spanning said walls internally, a screen unit detachably engageable within the open top of said pocket component and supported by said screen unit supports, and means to hold said unit in said detachable relationship partially recessed within said open top of said pocket component, said screen unit comprising a one piece arcuately curved plate substantially rectangular when viewed in plan and having an inner surface and an outer surface and a plurality of spaced and parallel slits milled through said plate, the cross sectional dimension of said slits increasing from said inner surface to said outer surface, said plate having a plurality of transverse abutments formed on the outer surface thereof engageable upon said screen unit supports.

3,957,653

APPARATUS FOR COLLECTION, SEPARATION AND ISOLATION OF BLOOD

Jacob B. Blecher, Fair Lawn, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Apr. 3, 1975, Ser. No. 564,646
Int. Cl.² B01D *21/26*
U.S. Cl. 210—518 **3 Claims**

1. Apparatus for the collection, separation and isolation of serum or plasma from capillary blood, which comprises;

a. a first tubular body having a fixedly closed end and an open end, said open end having a greater width than said closed end, said body and said open and closed ends together defining a blood collection reservoir with the capacity of from about 200 to about 1,000 microliters of blood;

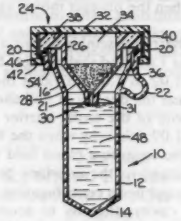
b. a first flange disposed about the outer periphery of said open end;

c. a movable first closure member adapted to nest in and to seal said open end, said closure member comprising;

i. a second tubular body having open upper and lower ends and which defines a sealant holding chamber, the opening in said lower end being of a dimension which is insufficient to permit the passage of a thixotrope under the force of one gravity but sufficient to permit the passage of said thixotrope under a centrifugal force;

ii. a second flange disposed about the outer periphery of said upper end;

iii. a second movable closure member for sealing said upper end, said second movable closure having means formed therein for releasably engaging said second flange in a fluid tight sealing association;



iiii. a thixotrope sealant held in said sealant chamber, said thixotrope having a specific gravity within the range of from 1.03 to 1.09;

d. means formed on said second flange for releasably engaging said first flange in a fluid tight association; and

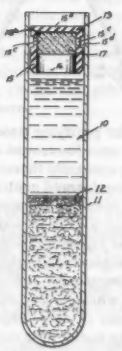
e. means of movably attaching said first closure to said first tubular body; whereby when both of said means for releasably engaging said second flange are engaged, the contents of said apparatus are hermetically sealed therein.

3,957,654

PLASMA SEPARATOR WITH BARRIER TO EJECT SEALANT

Waldemar A. Ayres, Sun City, Ariz., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Continuation-in-part of Ser. No. 446,361, Feb. 27, 1974, abandoned. This application June 5, 1975, Ser. No. 583,955
Int. Cl.² B01D *21/26*
U.S. Cl. 210—516 **5 Claims**



1. A separator assembly, capable of separating blood into its component parts of plasma or serum and cellular portion comprising:

a. a tubular container having an open end which is adapted to receive blood to be separated into a light and a heavy phase;

b. a barrier assembly insertable into the container after contained blood has been separated into its light and heavy phases said barrier assembly having a diameter less than the inside diameter of said container;

c. said barrier assembly comprising an outer shell closed at the top and defining a cavity within the shell, a plurality of ports extending from the upper portion of the cavity to the outside of the shell, a plunger fitted into and closing the lower end of the cavity with space between the top of the plunger and the upper portion of the cavity, and a sealant inserted into the space in the cavity, said sealant having a consistency selected such that it will be ejected from the ports when the plunger moves upwardly into the cavity;

d. said shell of the barrier assembly having a specific gravity between 1.03 and 1.09, and said plunger having a specific gravity of from 1.02 to 1.08 provided the density of the plunger is less than the density of said shell and the average specific gravity of the entire barrier assembly is between 1.03 and 1.09; whereby when the barrier assembly is inserted into the separated blood held within said container it will descend to the interface between the light and heavy phase and upon centrifugation the plunger will move into said cavity, thereby to squeeze the sealant within said cavity and cause it to eject through said ports to form a circular seal between the barrier assembly and the inner surface of the container at a position slightly above the interface between the separated light and heavy phases.

3,957,655

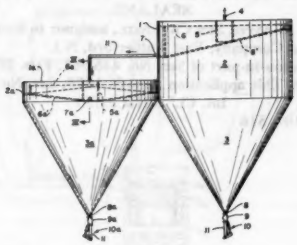
SPHINCTER CONE ASSEMBLY FOR PURIFYING WATER

Bernard B. Barefoot, R.D. No. 3, Sunset Drive, Export, Pa. 15632

Continuation-in-part of Ser. No. 411,344, Oct. 31, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,776

Int. Cl.² B01D *12/00*

U.S. Cl. 210—519 **2 Claims**



1. A sphincter cone for purifying water, comprising a cone shaped vessel having its apex lowermost and having a cylindrical extension extending upwardly thereof, a cylindrical surge tank with an open bottom formed centrally at the top of said extension, a cylindrical inner wall spaced inwardly from said cylindrical extension and a bottom wall between said inner wall and said cylindrical extension, which bottom wall is tapered downwardly throughout its perimeter towards a lower portion, to form a perimetrically extending annular well or sump into the top of which water will flow after flowing through the open bottom of said surge tank and over said cylindrical inner wall, an outlet pipe connected to said lower portion of said sump, a normally open pinch valve, with rubber internals, located below said apex and connected to the bottom of said vessel, a normally closed dump valve comprising a cylinder having a top end connected to said pinch valve and a valve element connected at the bottom end and in which cylinder sludges are formed beneath the apex of said cone, fluid operated means for slowly closing said pinch valve while said dump valve is closed so that solids collected in the void between said pinch valve and said dump valve are slowly put under an additional hydraulic wringer type rolling pressure by said pinch valve to force out the water entrained within the solids, and means for subsequently closing said pinch valve and opening said dump valve by opening the bottom of said cylinder, thus discharging. small compacted relatively dry slugs, of the collected particulates.

3,957,656

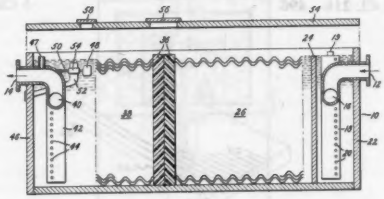
PLATE SEPARATOR FOR FLUID MIXTURES

Joseph L. Castelli, 611 Forest Road, Wayne, Pa. 19087

Continuation of Ser. No. 248,421, April 28, 1972, abandoned. This application Mar. 4, 1974, Ser. No. 447,795

Int. Cl.² B01D *21/00*

U.S. Cl. 210—521 **2 Claims**



1. Apparatus for separating components of different densities in a fluid mixture or emulsion comprising:

a container;

inlet means at one end of said container for introducing said mixture at various levels within said container to minimize turbulence in said container;

first discharge means at the other end of said container for removing the more dense component at various levels below the level of the less dense component;

second discharge means at said other end of said container for removing the less dense component at a level above the top level of the more dense component;

at least one stack of horizontally disposed spaced plates having alternating crests and valleys forming alternately constricting and expanding passages normal to the flow of the mixture between said inlet means and said discharge means; and

said spaced plates having spaced bleed holes at the peaks of the crests.

3,957,657

FIRE FIGHTING

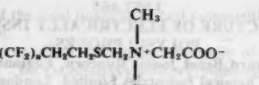
Peter J. Chiesa, Jr., Coatesville, Pa., assignor to Philadelphia Suburban Corporation, Bryn Mawr, Pa.

Continuation-in-part of Ser. No. 131,763, April 6, 1971, abandoned, and a continuation-in-part of Ser. No. 254,404, May 18, 1972, Pat. No. 3,849,315. This application June 13, 1973, Ser. No. 369,584

Int. Cl.² A62D *1/00*

U.S. Cl. 252—3 **7 Claims**

1. In an aqueous film-forming fire-fighting foamable liquid containing dissolved fluorocarbon and silicone surfactants in amounts that give the liquid a surface tension at least as low as 19 dynes per centimeter but do not give it good foamability and also containing one or more foamability-increasing surfactants that are neither fluorocarbons nor silicones, to bring the foamability of the liquid up to the level needed for a fire-fighting foam, the improvement according to which the fluorocarbon surfactant has the structure



where n is between 5 and 9.

3,957,658

FIRE FIGHTING

Peter J. Chiesa, Jr., Coatesville, Pa., and Louis R. Di Maio, Hockessin, Del., assignors to Philadelphia Suburban Corporation, Bryn Mawr, Pa.

Continuation-in-part of Ser. No. 131,763, April 6, 1971, abandoned. This application June 13, 1973, Ser. No. 369,585

Int. Cl.[2] A62D *1/00*

U.S. Cl. 252—3 16 Claims

1. An aqueous film-forming foamable liquid having a surface tension at least as low as 19 dynes per centimeter and having dissolved in it a mixture of a water-soluble fluorocarbon surfactant and a water-soluble silicone surfactant, the fluorocarbon surfactant having a hydrophobic perfluorinated carbon chain acyclically connected to a hydrophilic moiety and being anionic, amphoteric or cationic, the silicone surfactant being anionic, nonionic or amphoteric, having a silicone moiety containing two to seven silicons, a hydrophilic moiety for every one-half to four silicons in the silicone moiety, its silicone moiety being otherwise fully methylated, the mixture having about 20 to 80% of the fluorocarbon surfactant and 80 to 20% of the silicone surfactant and the fluorocarbon surfactant being in a concentration of from about 0.05 to about 0.15 percent in the aqueous liquid being foamed.

16. The liquid of claim 1 in which the silicone and fluorocarbon surfactant mixture does not provide fire-fighting foamability to the liquid, the foamability being brought up to fire-fighting level by at least one foam-building surfactant that is neither a silicone nor a fluorocarbon surfactant.

3,957,659

CRUDE OIL COMPOSITIONS HAVING IMPROVED LOW TEMPERATURE FLOW PROPERTIES

Eduard J. van de Kraats, and Arnold A. Buitelaar, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 152,399, June 11, 1971, abandoned. This application July 2, 1973, Ser. No. 376,067

Claims priority, application United Kingdom, Mar. 5, 1971, 6132/71

Int. Cl.[2] E21B *43/12;* C09K *3/00*

U.S. Cl. 252—8.3 7 Claims

1. A crude oil composition having improved low-temperature flow properties upon exposure to cooling at a rate not exceeding 5°C per hour which comprises a waxy crude oil having a wax content of 6–20% weight and having incorporated therein from 0.001 to 2.0% by weight of a copolymer of (1) a C_{14} to C_{30} alkyl ester of acrylic or methacrylic acid and (2) 4-vinyl pyridine, the ratio of alkyl side chains to pyridine rings being from about 1:1 to about 20:1 and the copolymer having a number average molecular weight of between 1,000 and 1,000,000.

3,957,660

DRILLING FLUID

Mahmoud S. Kablaoui, and Jack H. Kolaian, both of Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed June 27, 1974, Ser. No. 483,597

Int. Cl.[2] C09K *7/02*

U.S. Cl. 252—8.5 C 4 Claims

1. An aqueous drilling fluid consisting essentially of water, clay solids and as the dispersant from about 0.1 to about 10 pounds per barrel of drilling fluid of a sulfonated reaction product mixture consisting essentially of about 50–70% of catechol disulfonate, 10–15% of chlorophenol sulfonate, 5–15% of phenol sulfonate, the balance comprising about 15–20% of undistillable and unidentifiable material, on a weight basis, said sulfonated reaction product mixture being obtained by chlorinating a mixture of cyclohexanol and cyclohexanone to form a reaction mixture of 2,2-dichloro and 2,6-dichlorohexanone, reacting said resulting reaction mixture with acetic anhydride, acetic acid and boron trifluoride etherate as a catalyst under refluxing conditions, adding concentrated sulfuric acid thereto, and continuing said refluxing, cooling the resulting refluxed reaction mixture, recovering an admixture of catechol diacetate, o-chlorophenyldiacetate, phenyl acetate and an unidentifiable material, hydrolzing said recovered admixture to form a mixture of catechol, phenol, o-chlorophenol and undistillable unidentified material, sulfonating said recovered hydrolyzed mixture, and recovering therefrom said sulfonated reaction product mixture.

3,957,661

FABRIC SOFTENING LAUNDRY DETERGENT CONTAINING ORGANIC ESTERS OF PHOSPHORIC ACID

Claude Vérité, Paris, France, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed July 13, 1973, Ser. No. 378,879

Claims priority, application France, July 25, 1972, 72.26684; July 25, 1972, 72.26685; July 25, 1972, 72.26683

Int. Cl.[2] C11D *1/34, 1/83, 1/08;* D06M *13/32*

U.S. Cl. 252—8.9 16 Claims

1. A heavy duty particulate laundry detergent which consists essentially of, by weight:

a. 0.1 to 4% of $R^1O(CH_2CH_2O)_m PO(OM)_2$

b. 0.1 to 3% of $[R^1O(CH_2CH_2O)m]_2POOM$

c. 0.1 to 2% of $R^2OPO(OM)_2$;

d. 0.1 to 1% of $(R^2O)_2POOM$;

wherein,

R^1 is an alkyl of 14 to 20 carbon atoms,

R^2 is an alkyl of 6 to 10 carbon atoms,

m is from 1 to 6 and

M is alkali metal or ammonium, and

wherein the proportions of (a) to (b) and of (c) to (d) are from 4:1 to 2:3, and the proportions of the total of (a) and (b) to the total of (c) and (d) is from 19:1 to 1:1;

e. 10 to 35% of alkali metal or ammonium C_{11}-C_{15} alkyl benzene sulfonate;

f. 2 to 50% of an alkali metal silicate having an alkali metal oxide to silicon dioxide ratio from 1:2 to 1:3.2;

g. 10 to 60% of an alkali metal non-silicate builder salt selected from the group consisting of tripolyphosphate, carbonate, bicarbonate, nitrilotriacetate, 2-hydroxy-ethyl nitrilodiacetate, citrate and gluconate; and

h. 1 to 15% moisture.

3,957,662

PHARMACEUTICAL LUBRICANTS

Surendra Anandrao Sangekar, Elizabeth, N.J., and Prabhakar Ranchhordas Sheth, Nanuet, N.Y., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 8, 1972, Ser. No. 279,133

Int. Cl.[2] C10M *1/40, 1/54, 1/24, 3/18*

U.S. Cl. 252—11 2 Claims

1. An improved pharmaceutical lubricant composition consisting essentially of finely divided magnesium stearate, calcium stearate or mixtures thereof substantially uniformly coated with from about 1% by weight to about 5% by weight based on the weight of said magnesium or calcium stearate of surfactant selected from the group consisting of sodium lauryl sulfate, polyoxyethylene (20) sorbitan mono-oleate and dioctyl sodium sulfosuccinate.

3,957,663

LUBRICANT COMPOSITION FOR DRILLING PIPE

Vladimir Sergeevich Shavyrin, ploschad Svobody, 4, kv. 18; Vyacheslav Nikolaevich Gusakov, Ul. Kuibysheva, 23, kv. 3, both of Gorky; Klavdia Vasilievna Pankova, Ul. Tsiolkovskogo, 1a, kv. 50, Volgograd; Nina Petrovna Polyakova, Ploschad Svobody, 4, kv. 116; Natalya Petrovna Shirkaeva, Ul. Svetloyarskaya, 75, kv. 5, both of Gorky; Valentin Nicolaevich Gorin, Ul. Basseinaya, 53, kv. 1; Oleg Semenovich Golovin, Ul. Mikhailova, 8, kv. 29, both of Leningrad, all of U.S.S.R.; Alexei Egorovich Mastjukov, deceased, late of Gorky, U.S.S.R., and Maria Pavlovna Mastjukova, heir, ploschad Svobody, 4, kv. 67, Gorky, U.S.S.R.

Continuation-in-part of Ser. No. 276,041, July 28, 1972, abandoned. This application May 23, 1974, Ser. No. 472,865

Int. Cl.[2] C10M *3/12*

U.S. Cl. 252—43 1 Claim

1. A lubricant composition consisting essentially of; (A) from 45 to 55 percent of a gear-box oil, which is a product of petroleum rectification with a congealing temperature of not higher than −20°C, impurities not exceeding 0.05 percent by weight, a relative viscosity at 100°C of 2.7°to 3.2°and an open cup flash of at least 170°C; (B) 4 to 6 percent of crystalline petroleum paraffins of a melting point of at least 50°C; (C) from 30 to 45 percent by weight of a distillation residue obtained after isolation of the rosin and rectification of wood turpentine and pine flotation oil; (D) from 0 to 21 percent of bitumen which has a melting point of at least 90°C; a solubility in chloroform and benzene of at least 99 percent by weight and a depth of needle penetration at 25°C in the range of from 5 to 20 mm; wherein said composition is prepared by heating components (A), (B), (C) and (D) to 100°C and holding the mixture at said temperature for 20 minutes while stirring and subsequently heating said mixture to 300°C and holding the mixture at 300°C for 1 hour.

3,957,664

LUBRICANT AND HYDRAULIC FLUID COMPOSITIONS

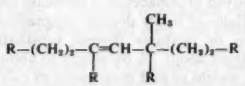
William J. Heilman, Allison Park, and Thomas J. Lynch, Harmar Twp., both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 274,319, July 24, 1972, Pat. No. 3,876,720. This application Dec. 12, 1974, Ser. No. 532,157

Int. Cl.[2] C10M *1/16*

U.S. Cl. 252—59 6 Claims

1. In a composition of matter comprising a major proportion of an oil of lubricating viscosity and a minor portion of conventional lubricating oil and hydraulic fluid additive in an amount sufficient to effect each additive attendant function including at least one lubricating oil antioxidant; the improvement comprising using as the base oil a composition of the formula



wherein each R group is a saturated alkyl group independently having from about 4 to about 12 carbon atoms.

3,957,665

MANUFACTURE OF ELECTRICALLY INSULATING POLYSULPHONES

Michael Edward Benet Jones, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 735,563, June 10, 1968, abandoned, which is a division of Ser. No. 657,538, Aug. 1, 1967, abandoned, and a continuation-in-part of Ser. No. 320,508, Oct. 31, 1963. This application July 15, 1974, Ser. No. 488,396

Claims priority, application United Kingdom, Nov. 6, 1962, 41976/62; Mar. 18, 1963, 10592/63

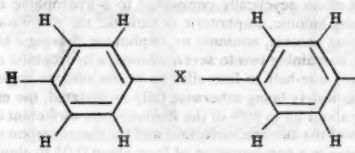
Int. Cl.[2] H01B *3/00;* H01G *4/02*

U.S. Cl. 252—63.2 7 Claims

1. A condenser comprising an electrically conductive portion which is electrically insulated by a shaped polysulphone formed of repeating units having the structure

$$-Ar-SO_2-$$

where Ar is a divalent aromatic residue derived from diphenyl or a compound having the structure

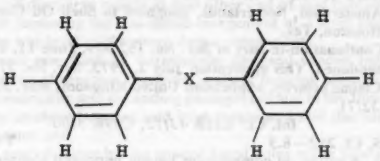


where X is —O— or —S—, and Ar may vary from unit to unit in the polymer chain.

4. An electrical structure comprising an electrically conductive component electrically insulated by a layer of a polysulphone formed of repeating units having the structure

$$-AR-SO_2-$$

where Ar is a divalent aromatic residue derived from diphenyl or a compound having the structure



whre X is —O— or —S—, and Ar may vary from unit to unit in the polymer chain.

3,957,666

PHENOXYBIPHENYL AND PHENOXYTERPHENYL COMPOUNDS AND COMPOSITIONS

William C. Hammann, Creve Coeur, and Robert M. Schisla, Kirkwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 247,528, April 26, 1972, Pat. No. 3,860,661, which is a continuation-in-part of Ser. No. 845,079, July 25, 1969, abandoned, which is a continuation-in-part of Ser. No. 801,875, Aug. 19, 1968, abandoned, which is a division of Ser. No. 310,457, Sept. 20, 1963, Pat. No. 3,406,207. This application May 30, 1974, Ser. No. 474,484

Int. Cl.[2] C09K *3/00;* C10M *3/14*

U.S. Cl. 252—73 2 Claims

1. A functional fluid composition consisting essentially of a mixture of x,x'di(phenoxyphenoxy)biphenyls wherein at least

40 percent of the total linkages in said composition are in the meta position.

2. A functional fluid consisting essentially of a mixture of 3,3'- and 3,4'- bis (m-phenoxyphenoxy)biphenyl.

3,957,667

HYDRAULIC OIL COMPOSITION

Yoshiharu Tanizaki, Kamakura; Hiroshi Kawaguchi, Tokyo, and Kenichiro Minagawa, Kawasaki, all of Japan, assignors to Nippon Oils and Fats Company Limited, Tokyo, Japan

Filed Dec. 23, 1974, Ser. No. 536,950

Claims priority, application Japan, Dec. 29, 1973, 49-2350

Int. Cl.² C09K *3/00;* **C10M** *3/22*

U.S. Cl. 252—73 **4 Claims**

1. A hydraulic oil composition comprising 100 parts by weight of a mixture of 60–98% by weight of a polyoxyalkylene glycol monoalkyl ether having the following general formula (1) and 2–40% by weight of at least one of polyoxyalkylene glycol dialkyl ethers having the following general formulae (2) and (3),

$$R^1O(C_mH_{2m}O)_nH, \quad (1)$$

$$R^1O(C_mH_{2m}O)_nR^2 \quad (2)$$

and

$$[R^1O(C_mH_{2m}O)_n]_2CH_2 \quad (3)$$

wherein R^1 and R^2 represent alkyl groups having 1–3 carbon atoms respectively, $C_mH_{2m}O$ represents an oxyalkylene group, m represents a positive integer of 2, 3 or 4, and n represents a positive integer of 2–6, the oxyethylene content in the total oxyalkylene of compounds (1), (2) and (3) being 40–90% by weight, and 2–40 parts by weight of a high molecular weight polyoxyalkylene compound having a kinematic viscosity of at least 8 cst at 210°F and having not less than 90% by weight of polyoxyalkylene glycol in the molecule and 15–80% by weight of oxyethylene based on the total oxyalkylene in the molecule.

3,957,668

NOVEL EPOXY COMPOUNDS AND FUNCTIONAL FLUID COMPOSITIONS CONTAINING SUCH COMPOUNDS

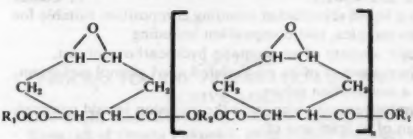
Martin B. Sheratte, Reseda, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Sept. 24, 1973, Ser. No. 400,130

Int. Cl.² C10M *3/08*

U.S. Cl. 252—78 **33 Claims**

1. A functional fluid composition consisting essentially of by weight (1) about 50 to about 99.8 percent of a phosphorus compound selected from the group consisting of phosphorus esters and amides of an acid of phosphorus, and mixtures thereof, (2) about 0.1 to about 30 percent of a viscosity index improver, and (3) about 0.2 to about 20 percent of an epoxy compound sufficient to prevent precipitation of deposits in said fluid, said epoxy compound having the general formula



wherein R_1 is selected from the group consisting of alkyl of from 1 to 10 carbon atoms, aryl of from 6 to 9 carbon atoms, alkoxy alkyl wherein the total number of carbon atoms ranges from 2 to about 10, and halogenated aryl of from 6 to 9 carbon atoms, R_2 is selected from the group consisting of alkylene of from 2 to 4 carbon atoms, polyalkylene oxides, the alkylene group thereof containing from 2 to 4 carbon atoms, arylene oxides containing from 6 to 15 carbon atoms, and wherein a portion of said R_2 radical can be replaced by R_3, R_3 being a polyvalent radical of the hydrocarbon portion of a polyhydric alcohol selected from the group consisting of trihydric and tetrahydric alcohols, and wherein *n* can range from about 1 to about 50, and having a molecular weight up to about 10,000.

3,957,669

METAL TREATMENT

Surindar Singh Tulsi, Guildford, and John Stuart Stevenson, Ruardean, both of England, assignors to Oxy Metal Finishing (Great Britain) Ltd., England

Filed Feb. 25, 1974, Ser. No. 445,730

Claims priority, application United Kingdom, Mar. 1, 1973, 10031/73

Int. Cl.² C09K *13/06*

U.S. Cl. 252—79.4 **6 Claims**

1. An aqueous acidic etching composition useful for pretreatment of steel articles prior to surface finishing comprising 2% to 6% w/v of a strong mineral acid and 0.5 to 30 grams per liter of benzene sulphinic acid or a water soluble salt thereof.

3,957,670

ACTIVATORS FOR INORGANIC PER-COMPOUNDS

Klaus Uhl, Neuenhain, Taunus; Hermann Schmadel, Hofheim, Taunus; Gerhart Schneider, Konigstein, Taunus, and Eckhard Milewski, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

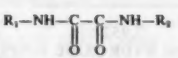
Filed Dec. 4, 1974, Ser. No. 529,511

Claims priority, application Germany, Dec. 4, 1973, 2360340

Int. Cl.² C11D *7/54*

U.S. Cl. 252—102 **4 Claims**

1. An oxidizing and bleaching composition useful in known oxidizing, bleaching and washing operations which composition consists essentially of an inorganic per-compound which is hydrogen peroxide, an alkali metal per oxide, perborate, perphosphate, percarbonate, persilicate, or persulfate, and as activator for the inorganic per-compound an acylated oxamide of the formula



in which R_1 and R_2 are acyl groups of 2–9 carbon atoms, the amount of activator being such that about 0.5–8 acyl groups are present per active oxygen atom of the inorganic per-compound.

3,957,671

ACID MIX COMPOSITIONS CONTAINING BENZOIC ACID

John A. Sagel, Mount Healthy, Ohio, and Clarence Edward Weber, Cold Spring, Ky., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 13, 1974, Ser. No. 523,392

Int. Cl.² C11D *3/20*

U.S. Cl. 252—142 **12 Claims**

1. An acid mix having a low viscosity comprising:

a. a member selected from the group consisting of alkyl benzene sulfonic acid, alkyl ether sulfuric acid, fatty alcohol sulfuric acids, α-olefin sulfonic acids, and α-sulfocarboxylic acids and the esters of α-sulfocarboxylic acids, and mixtures thereof; and

b. an effective amount of benzoic acid to lower the acid mix viscosity.

3,957,672

DISPLACEMENT OF ORGANIC LIQUID FILMS FROM SOLID SURFACES BY NON AQUEOUS SYSTEMS

William A. Zisman, Silver Spring, Md., and Marianne K. Bernett, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 23, 1973, Ser. No. 418,347
Int. Cl.[2] C11D 7/50
U.S. Cl. 252—171 11 Claims

1. A non-aqueous liquid composition for displacing liquid films from solid surfaces which consists essentially of

a. a fluorinated polyether having the formula $CF_3CF_2CF_2[OCF(CF_3)CF_2]_nOCHFCF_3$, where n is an integer from 1 to 8 and said fluorinated polyether is present in an amount from 1 to 100 percent by volume;

b. from 0 to 99 percent by volume of a solvent selected from the group consisting of volatile liquid perfluoroalkanes, volatile liquid fully fluorinated bromo- and chloroalkanes, and fully substituted benzenes; and

c. from 0 to 1 percent by weight of a solute selected from the group consisting of fluoroalcohols, fluoromonocarboxylic acids, partially fluorinated diesters.

3,957,673

SCALE INHIBITOR COMPOSITIONS FOR APPLICATION ONTO METAL SUBSTRATES TO BE HEATED, AND THE METHOD THEREFOR

Akimi Umezono; Minoru Kitayama; Susumu Yamaguchi, and Hisao Odashima, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed July 16, 1973, Ser. No. 379,224
Claims priority, application Japan, July 20, 1972, 47-71990; Sept. 4, 1972, 47-87985; Oct. 23, 1972, 47-105282; May 21, 1973, 48-56531; May 21, 1973, 48-56532
Int. Cl.[2] C02B 5/02
U.S. Cl. 252—178 3 Claims

1. A scale preventive composition consisting essentially of 1 to 20 wt. parts of Cr_2O_3, 1 to 20 wt. parts of one or more of Al, Zn, Cu, Ni, Co, Mn, Mg, Fe, Cr, Ti, Zr, Sr, Mo, Sn, In, C, Fe_3O_4 and FeO, 5 – 80 wt. parts of one or more of silica powder, porcelain, magnesia powder, montmorillonite, $Mg\text{-}Cr_2O_3$ and $MgO\text{-}SiO_2$ and dolomite refractories or clay 5 to 120 wt. parts of SiO_2 and 5 to 120 wt. parts of water glass.

3,957,674

MAGNESIUM HYDROXIDE SUSPENSION

Hiroshi Sano; Nozomu Matsuno, and Katsumi Okina, all of Iwaki, Japan, assignors to Shin Nihon Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sept. 21, 1973, Ser. No. 399,604
Claims priority, application Japan, Oct. 17, 1972, 47-103258
Int. Cl.[2] B01J 21/10; B01F 3/12
U.S. Cl. 252—182 6 Claims

1. Fluid aqueous suspensions of magnesium hydroxide having a solids content of from 35 to 60 percent by weight based on the total weight of a viscosity up to 10,000 cp. and containing at least about 0.5 percent by weight of a sodium naphthalene sulfonate based on the weight of magnesium hydroxide.

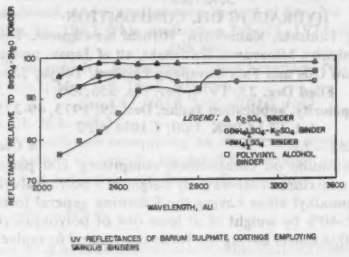
3,957,675

ULTRAVIOLET LIGHT REFLECTIVE COATING

John B. Schutt, Silver Spring, Md., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Sept. 28, 1973, Ser. No. 401,919
Int. Cl.[2] H01Q 15/14; G02B 5/26
U.S. Cl. 252—300 7 Claims

1. A coating composition comprising a dispersion of barium sulphate in an aqueous solution of a water-soluble inorganic binder selected from the group consisting of alkali metal sulphates, ammonium sulphate and mixtures thereof, said coating composition containing from about 30.6 to about 39.8 percent by weight of barium sulphate and from about 55.6 to about 64.4 percent by weight of water, the balance of the



UV REFLECTANCES OF BARIUM SULPHATE COATINGS EMPLOYING VARIOUS BINDERS

composition consisting of from about 0.005 to about 11.8 percent by weight of the water-soluble inorganic binder, said composition after evaporation of the vaporizable components form a layer thereof exhibiting high reflectance to ultraviolet light having wavelengths down to about 2,000 Angstrum units.

3,957,676

CHEMICAL DIGESTION OF LOW LEVEL NUCLEAR SOLID WASTE MATERIAL

Carl R. Cooley, and Ronald E. Lerch, both of Richland, Wash., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 22, 1972, Ser. No. 291,476
Int. Cl.[2] C09K 3/00
U.S. Cl. 252—301.1 W 6 Claims

1. A method for processing low level light weight, bulky combustible nuclear solid waste material comprising the steps of reacting said solid waste material with concentrated sulfuric acid at a temperature within the range of 230° – 300°C and simultaneously and/or thereafter contacting said reacted waste with concentrated nitric acid or nitrogen oxides whereby carbonaceous material is oxidized to gaseous by-products and a low volume residue.

3,957,677

COMPOSITION FOR USE IN SCINTILLATOR SYSTEMS

Veikko Tarkkanen, Delft, Netherlands, assignor to Packard Instrument Company, Inc., Downers Grove, Ill.

Filed Apr. 9, 1973, Ser. No. 349,550
Claims priority, application United Kingdom, Apr. 10, 1972, 16499/72; Apr. 10, 1972, 16500/72
Int. Cl. C09k 1/02
U.S. Cl. 252—301.17 11 Claims

1. In a liquid scintillation counting composition suitable for aqueous samples, said composition including

a major amount of an aromatic hydrocarbon solvent,

a minor amount of an ethoxylated alkyl phenol surfactant, and a scintillation solute,

the improvement comprising the inclusion in said composition of at least one of:

a. a small amount, effective to reduce chemiluminescence upon the addition of an alkaline material to said composition, of a substituted ethoxylated carboxylic acid wherein said substituent is an alkoxy group of about 5–24 C atoms or an alkyl phenoxy group wherein said alkyl is of about 8–16 atoms, wherein said ethoxy groups are from about 3–12, and wherein said carboxylic acid is the residue of acetic or a propionic acid, and

b. a small amount, effective to enhance the water miscibility of said composition, of a tertiary amine salt of

said substituted ethoxylated carboxylic acid or a quaternary ammonium salt of said substituted ethoxylated carboxylic acid.

3,957,678

METHOD OF MANUFACTURING A LUMINESCENT SULFIDE

Johannes Aloysius Maria Dikhoff, and Gijsbertus Marinus Smith, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,439

Claims priority, application Netherlands, Jan. 11, 1973, 7300382

Int. Cl.² C09K *11/30, 11/18, 11/14*

U.S. Cl. 252—301.6 S **7 Claims**

1. In the method of manufacturing a luminescent sulfide of at least one of the elements selected from the group consisting of zinc and cadmium, said luminescent sulfide being self-activated or activated by at least one element selected from the group consisting of silver, copper and gold and coactivated by at least one element selected from the group consisting of aluminum, gallium, indium, scandium and the rare earth metals comprising introducing into a reaction vessel a reaction mixture comprising at least one compound selected from the group consisting of zinc sulfide and cadmium sulfide and the desired quantities of compounds of the coactivator and activator elements and a mixture of carbon and sulfur, said mixture being capable upon heating of producing carbon disulfide, closing said vessel and heating said vessel to a temperature between 950° and 1250°C, the improvement wherein said carbon is separated from said reaction mixture by a gas permeable partition and the carbon disulfide produced by the reaction of said carbon and sulfur at said temperature is transported to the reaction mixture by diffusion through said gas permeable partition while in the gaseous state.

3,957,679

NOVEL SODIUM ALUMINUM PHOSPHATE CHEESE EMULSIFIERS

Thomas P. Kichline, Chesterfield, and Allen H. Kranz, Florissant, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 1, 1973, Ser. No. 411,609

Int. Cl.² B01F *17/14;* **C01B** *25/30;* **A23C** *19/00*

U.S. Cl. 252—351 **5 Claims**

1. A sodium aluminum phosphate composition having an empirical formula

$$x\,Na_2O \cdot y\,Al_2O_3 \cdot 8\,P_2O_5 \cdot H_2O$$

wherein x is a number higher than 15 up to and inclusive of 24, y is a number between 1.0 and 3.9 inclusive, and z is a number between 0 and 50 inclusive.

3,957,680

PROCESS FOR THE PREPARATION OF SURFACE ACTIVE AGENTS

Fumio Fujii; Koji Kurahara; Akitoshi Igata, and Toshihiro Koga, all of Omuta Fukuoka, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Aug. 19, 1974, Ser. No. 498,718

Int. Cl.² C08G *14/12;* **B01F** *17/52;* **C09B** *67/00;* **D06P** *1/56*

U.S. Cl. 252—353 **7 Claims**

1. A process for the preparation of a surface active agent which comprises first adding cresol, sodium sulfite and 2-hydroxynaphthalene to water as solvent, then adding formaldehyde to the resultant solution and reacting the mixture under normal pressure to obtain said surface active agent.

3,957,681

PROCESS FOR MANUFACTURING GASEOUS MIXTURES RICH IN HYDROGEN

Tadayoshi Tomita, Yokohama; Katsutoshi Kikuchi, Fujisawa, and Takayuki Sakamoto, Tokyo, all of Japan, assignors to Toyo Engineering Corporation, Tokyo, Japan

Continuation of Ser. No. 178,264, Sept. 7, 1971, abandoned. This application Nov. 7, 1974, Ser. No. 521,865

Claims priority, application Japan, Sept. 4, 1970, 45-77613

Int. Cl.² C01B *2/10, 2/14*

U.S. Cl. 252—373 **3 Claims**

1. A process for manufacturing gaseous mixtures rich in hydrogen by the catalytic steam reforming of a feed stock of normally liquid hydrocarbons which comprises feeding into a reactor said feed stock and steam at a molar ratio of steam/carbon in the range of from about 2/1 to 10/1 and therein contacting same with particles of reforming catalyst, at a temperature in the range of from above 850° to 1100°C, at a pressure of from 1 to 300 atmospheres, at a space flow velocity of from 1000 to 3000/hr. said reforming catalyst consisting essentially of a silica free crystalline eutectic of 20 to 60 weight percent of calcium oxide and the balance of aluminum oxide, and wherein the steam/carbon molar ratio and the reaction temperature are effective to prevent deposition of carbon on said reforming catalyst.

3,957,682

PREPARATION OF METHANE, HYDROGEN AND CARBON MONOXIDE CONTAINING GASES

Tansukhlal G. Dorawala; John H. Estes, and Edwin R. Kerr, all of Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 14, 1973, Ser. No. 424,979

Int. Cl.² C01B *2/16*

U.S. Cl. 252—373 **20 Claims**

1. The method of preparing methane which comprises

passing a mixture of steam and a non-aromatic charge hydrocarbon into contact with an activated catalyst consisting essentially of a massive metal screen containing at least about 50% nickel, said activated catalyst having been activated by heating in the presence of an oxygen-containing gas;

maintaining said mixture of steam and charge non-aromatic hydrocarbon at temperature of about 700°F–1100°F and pressure of 300–800 psig during said contact with catalyst thereby converting said non-aromatic charge hydrocarbon to a product gas containing methane;

maintaining the mole ratio of steam to charge hydrocarbon at 5–20:1; and

recovering said product gas containing methane.

3,957,683

PASTE-LIKE MIXTURES CONTAINING A CROSS-LINKING AGENT AND A CONDENSATION CATALYST

Paul Hittmair; Wolfgang Hechtl; Ernst Wohlfarth, and Richard Schmidlkofer, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Mar. 18, 1974, Ser. No. 452,159

Claims priority, application Germany, Mar. 16, 1973, 2313218

Int. Cl.² B01J *21/08, 31/12, 31/04*

U.S. Cl. 252—428 **8 Claims**

1. An improved paste-like composition which is to be mixed with an organopolysiloxane composition to form a room temperature curable composition, said paste-like composition consisting essentially of a mixture of a cross-linking agent and a condensation catalyst capable of curing the organopolysiloxane composition said condensation catalyst being present in an amount of 1 part by weight for each 1 to 10 parts by weight of the cross-linking agent, the improvement which comprises adding to the mixture a hydrophobic silicon dioxide thickening agent which is a solid at room temperature and has a

surface area of at least 50m²/g, said hydrophobic silicon dioxide is present in an amount of one part by weight for each 1 to 10 parts by weight based on the total weight of the mixture containing the cross-linking agent and condensation catalyst.

3,957,684

CONTINUOUS MANUFACTURE OF SOLUTIONS OF COBALT CARBONYL AND COBALT CARBONYL HYDRIDE IN ORGANIC SOLVENTS

Max Strohmeyer, Limburgerhof; Hans Juergen Nienburg, Heidelberg; Rudolf Kummer, Frankenthal, and Heinz Hohenschutz, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 24, 1974, Ser. No. 482,251

Claims priority, application Germany, June 27, 1973, 2332638

Int. Cl.² B01J *27/20*

U.S. Cl. 252—428 **7 Claims**

1. In a process for the manufacture of a solution of cobalt carbonyl and cobalt carbonyl hydride in an organic solvent which is water-immiscible or sparingly water-miscible by treating an aqueous solution of a cobalt salt with carbon monoxide and hydrogen at a temperature of from 50° to 200°C and a pressure of from 50 to 500 atmospheres in the presence of said organic solvent, the improvement which comprises using n-butanol as said organic solvent with an initial content of 0.02 to 4% by weight of cobalt dissolved in the form of cobalt carbonyl, cobalt carbonyl hydride or mixtures thereof, the aqueous solution and said n-butanol with said initial content of cobalt being fed cocurrently for treatment with said carbon monoxide and hydrogen through a zone in which a turbulent flow is maintained.

3,957,685

PROCESS FOR PRODUCING CATALYST SUPPORTS OR CATALYST SYSTEMS HAVING OPEN PORES

Helmut Heide, Niederhochstadter Pfad 23, 6231 Schwalbach, Taunus; Ulrich Hoffmann, Kronthaler Weg 10, 6236 Eschborn, Niederhochstadt; Günther Brötz, Weisskirchner Str., 6372 Stierstadt, Taunus, and Eva Poeschel, Hedwig-Dransfeld-Str. 2, 6 Frankfurt am Main, all of Germany

Filed Feb. 27, 1974, Ser. No. 446,266

Int. Cl.² B01J *35/04*

U.S. Cl. 252—432 **16 Claims**

1. A process for producing a solid ceramic catalyst, a solid ceramic-metal catalyst, a solid metal catalyst, a solid ceramic catalytic support, a solid ceramic-metal catalytic support or a solid metal catalytic support, having open interconnecting pores using a framework in the production process which comprises (*a*) forming a dense agglomeration of spherical bodies of approximately uniform size, said spherical bodies being insoluble bodies having a low melting point or bodies which are soluble in a solvent, and said spherical bodies being capable of being dissolved, evaporated or burned to remove the framework, and (*b*) connecting together these bodies at their mutual contact points, the initial mutual points of contact of the spherical bodies being enlarged by attachment to each other by means of (i) dissolution, the bodies being connected together by pouring a solvent, which gradually dissolves the material of the spherical bodies, into said dense agglomeration of spherical bodies and by removing said solvent after a short reaction period leaving a film of said solvent on the bodies which forms a fluid meniscus on the contact points of the bodies, (ii) gluing or (iii) sintering into larger areas or surfaces of contact, whereby a framework corresponding in size and arrangement generally to the macropores and pore interconnections of said catalyst metal, said catalyst ceramic, said catalyst ceramic-metal, said catalytic metal support, catalytic ceramic support or said catalytic ceramic-metal support is produced, (*c*) filling the framework with a suspension containing, as the solid component, said catalyst metal or said catalyst ceramic or said catalyst ceramic-metal or said catalytic support metal or said catalytic support ceramic or said catalytic support ceramic-metal, said framework being prepared from spherical bodies capable of being evaporated or burned substantially below the sintering temperature of said solid component of said suspension used as the framework material, (*d*) partially or completely hardening said suspension by applying sufficient heat to effect said partial or complete hardening, (*e*) dissolving away or removing the framework without destroying the structure produced during such partial or complete hardening, said removal of the framework being achieved by applying sufficient heat to evaporate or burn said framework, and (*f*) if there has been only partial hardening of the cast mass, completely hardening said suspension by applying sufficient heat to effect said complete hardening.

3,957,686

CATALYST FOR HYDROCARBON CONVERSION

Pierre Duhaut, Le Vesinet; Germain Martino, Poissy, and Jean Miquel, Paris, all of France, assignors to Societe Francaise des produits pour Catalyse, Rueil-Malmaison, France

Filed Dec. 13, 1973, Ser. No. 424,200

Claims priority, application France, Dec. 13, 1972, 72.44449

Int. Cl.² B01J *27/08, 23/64;* C10G *35/08*

U.S. Cl. 252—441 **7 Claims**

1. A new catalyst consisting essentially of (a) alumina, (b) metallic platinum, (c) metallic iridium, (d) manganese in the form of manganese oxide and (e) halogen, the catalyst contents by weight with respect to the alumina being 0.005–1% of platinum, 0.005–1% of iridium, 0.005–5% of manganese expressed as manganese metal, and 0.1–10% of halogen in the form of halide.

3,957,687

HYDROALKYLATION CATALYST AND PROCESS

Alfred Arkell, Wappingers Falls, and John M. Crone, Jr., Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 4, 1972, Ser. No. 311,612

Int. Cl.² B01J *29/06;* C10G *35/06*

U.S. Cl. 252—455 R **17 Claims**

1. The method of increasing the catalytic activity of a catalyst composition containing a Group VIII metal on an acidic oxide support consisting essentially of a silica-alumina cracking catalyst which comprises

calcining said catalyst composition at 1350°–1450°F for at least about 2 hours thereby forming a calcined catalyst composition; and

reducing said calcined catalyst composition at temperature of above about 850°F and less than about 1000°F for at least about 8 hours thereby forming a catalyst composition characterized by increased activity.

16. The process for hydroalkylating a charge benzene with a hydroalkylating quantity of hydroalkylating quantity of hydrogen which comprises contacting said charge benzene with hydrogen at hydroalkylating conditions in the presence of a catalyst composition containing a Group VIII metal on an acidic oxide support consisting essentially of a silica-alumina cracking catalyst, said catalyst composition having been activated by the process which comprises

calcining said catalyst composition at 1350°–1450°F. for at least about 2 hours thereby forming a calcined catalyst composition; and

reducing said calcined catalyst composition at temperature of above about 850°F. for at least about 8 hours thereby forming a catalyst composition characterized by increased activity.

3,957,688

CATALYTIC DEHYDROGENATION PROCESS

Floyd Farha, Jr., and Lewis E. Drehman, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 15, 1973, Ser. No. 415,943
Int. Cl.² B01J 29/06
U.S. Cl. 252—455 R 12 Claims

1. A catalyst composition suitable for the dehydrogenation of a dehydrogenatable organic compound having from 2 to 12 carbon atoms per molecule in the presence of steam and in the absence of free oxygen consisting essentially of:

a. from about 0.1 to about 5 weight percent of a metal selected from the group consisting of nickel, palladium, platinum, iridium, osmium and mixtures thereof;

b. from about 0.01 to about 5 weight percent of tin; and

c. from about 0.1 to 5 weight percent of a metal selected from the group consisting of gold and silver and mixtures thereof; each of said (*a*), (*b*) and (*c*) being supported on a support selected from the group consisting of alumina, silica, magnesia, zirconia, alumino-silicates, Group II aluminate spinels and mixtures thereof.

3,957,689

PROCESS FOR PREPARING AN ATTRITION RESISTANT ZEOLITE HYDROCARBON CONVERSION CATALYST

John Joseph Ostermaier, and Curtis Homer Elliott, Jr., both of Baltimore, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Aug. 2, 1974, Ser. No. 494,247
Int. Cl.² B01J 29/06
U.S. Cl. 252—455 Z 5 Claims

1. A process for preparing a hydrocarbon conversion catalyst having high activity and high density which comprises:

a. preparing a buffered silica sol by decreasing the pH of a sodium silicate solution to pH 2.0 to 3.2 by adding a mixed sulfuric acid-aluminum sulfate solution,

b. adding clay before, during or after sol formation,

c. preparing a water slurry of a crystalline zeolitic aluminosilicate and adjusting the pH to about 3 to 5,

d. mixing said slurry with the buffered silica sol-clay slurry prepared in step (*b*), to prepare a spray drier feed slurry having a pH of 2.5 to 3.5

e. spray drying,

f. washing with water, drying and recovering the product.

3,957,690

HETEROGENEOUS CATALYST FOR OXIDATION OF PROPYLENE INTO PROPYLENE OXIDE IN THE LIQUID PHASE AND METHOD FOR PREPARING IT

Alexandr Vasilievich Bobolev, Leninsky prospekt, 30, kv. 104; Alexandr Sergeevich Tatikolov, Otkrytoe shosse, 6, korpus 5, kv. 23; Natalya Nikolaevna Lukashina, ulitsa Marii Ulyanovoi, 15, kv. 90; Ivan Stepanovich Krainov, Profsojuznaya ulitsa, 5, kv. 49, and Nikolai Markovich Emanuel, Vorobievskoe shosse, 2-b, kv. 42, all of Moscow, U.S.S.R.

Filed Mar. 14, 1973, Ser. No. 341,174
Claims priority, application U.S.S.R., Mar. 15, 1972, 1759606; Mar. 15, 1972, 1756208
Int. Cl.² B01J 23/10, 23/08, 23/22, 23/28
U.S. Cl. 252—462 11 Claims

1. A heterogeneous catalyst for oxidation of propylene into propylene oxide in the liquid phase, which is a mineral acid-modified carrier with at least one active component supported thereon, said active component being an oxide of a metal selected from the group consisting of scandium, yttrium, indium, gallium, thallium, and rare-earth elements of the lanthanum group, wherein said carrier was modified by treating with an aqueous solution of a mineral acid or mixture of mineral acids at 80° to 100°C., washing with water and drying at 300° to 400°C.

3,957,691

CATALYST FOR TREATING EXHAUST GAS FROM ENGINE VEHICLES

Shichiro Adachi, and Toshinobu Miyakoshi, both of Tokyo, Japan, assignors to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha (Tokyo Electronics Co., Ltd.), Tokyo, Japan

Filed July 5, 1973, Ser. No. 376,438
Claims priority, application Japan, Mar. 28, 1973, 48-35451; Mar. 29, 1973, 48-36089
Int. Cl.² B01J 21/04, 23/42, 23/46, 23/74
U.S. Cl. 252—465 2 Claims

1. A catalyst mass of sintered granules consisting essentially of ferric oxide and at least one other oxide of the group consisting of copper, manganese, and chromium oxide and having at least in part a spinel crystalline structure, and prepared by sintering granules of a homogeneous solid mixture consisting essentially of about 20–75 mol % ferric oxide and about 80–25 mol % of such other oxide at a temperature within the range of about 600°–1050°C for a time of about 0.5–10 hours and sufficient to produce said spinel structure, wherein 0.0005–2.0% of metallic ruthenium or 0.1–2.0% of platinum is added, based on the weight of the sintered mixture.

3,957,692

METHOD OF PREPARING A CATALYST

James Anthony Cairns, Wantage; Michael Joseph Holdoway; Robert Livingston Nelson, both of Abingdon, and Richard Stuart Nelson, Goring-on-Thames, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 3, 1974, Ser. No. 529,244
Claims priority, application United Kingdom, Dec. 10, 1973, 57208/73
Int. Cl.² B01J 21/04, 23/64, 23/84
U.S. Cl. 252—465 19 Claims

1. A method of preparing a catalyst which comprises the steps of

i. contacting a substrate with a sol of a refractory carrier material, drying to convert the sol to a gel, and firing, thereby to provide the substrate with a continuous adherent surface layer of the carrier material; and

ii. sputtering catalytic material onto the surface layer.

3,957,693

PROCESS FOR PRODUCING SELENIUM HOMOGENEOUSLY DOPED WITH TELLURIUM

Karl Heinz Neeb, Erlangen, and Herbert Neidl, Erlangen-Bruck, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation of Ser. No. 167,475, July 29, 1971, abandoned, which is a continuation of Ser. No. 808,131, March 18, 1969, abandoned. This application Dec. 26, 1972, Ser. No. 318,438
Claims priority, application United Kingdom, Mar. 19, 1968, 13330/68
Int. Cl.² H01L 29/18
U.S. Cl. 252—512 8 Claims

1. In a process for producing selenium homogeneously doped with tellurium involving adding tellurium to the selenium, bringing the mixture of selenium and tellurium to a molten state and cooling the molten mixture to a solidified melt, the improvement which comprises passing a stream of gas selected from the group consisting of an inert gas and hydrogen into and in contact with a body of a molten mixture of selenium and tellurium containing an oxygen compound as an impurity, removing oxygen compound with said gas stream discharging from said body of molten mixture, and continuing the passage of said gas stream into said body of molten mixture for a sufficient length of time to effect removal of the oxygen compound in said molten mixture.

3,957,694

RADIATION CURABLE INKS

Donald A. Bolon, Scotia, and Gary M. Lucas, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 27, 1974, Ser. No. 509,824
Int. Cl.[2] H01B *1/02*
U.S. Cl. 252—514 8 Claims

1. A radiation curable ink comprising by volume

A. from about 10% to 60% of an organic resin binder having a viscosity of from 50 to 10,000 centipoises at 25°C, and

B. from about 90% to 40% of a particulated electrically conductive metal containing material substantially free of metal containing material having an aspect ratio of diameter-to-thickness of a value greater than 20

where there is utilized in (A) from about 0.2% to about 2.5% by weight of a blend of at least two paraffin waxes consisting of waxes having a M.P. in the range of from about 135°F to about 180°F and waxes having a M.P. in the range of from 100°F to about 135°F, where a M.P. differential of from about 15°F to 45°F is maintained between the waxes in the blend, and where the percent by weight of paraffin wax having a M.P. of 135°F to 180°F can vary from about 0.1% to about 2.0% in (A).

3,957,695

DETERGENT COMPOSITIONS CONTAINING CALCIUM CARBONATE

Charles Bloor Davies, Wallasey; James Francis Davies, Wirral, and William Fredrick Soutar Neillie, Birkenhead, all of England, assignors to Lever Brothers Company, New York, N.Y. N.Y.

Filed Aug. 8, 1973, Ser. No. 386,827
Claims priority, application United Kingdom, Aug. 22, 1972, 39122/72; Jan. 23, 1973, 3321/73
Int. Cl.[2] C11D *3/065*
U.S. Cl. 252—532 30 Claims

1. A detergent composition comprising from about 5 to about 40% of a detergent active compound selected from the group consisting of an anionic active which does not form an insoluble calcium salt during use, a nonionic active, an amphoteric active, a zwitterionic active and mixtures thereof, from about 10 to about 75% of sodium or potassium carbonate, and from about 5 to about 60% of finely divided precipitated calcium carbonate prepared by passing carbon dioxide into a suspension of calcium hydroxide, said calcium carbonate having a surface area of about 30 to about 100 square metres per gram (m^2/g), the percentages being expressed by weight of the composition.

3,957,696

TERNARY SOLID IONICALLY CONDUCTIVE COMPOSITIONS AND METHOD OF PREPARING THE SAME

Johannes A. van Lier, Cleveland, and Kathleen K. Maszczynski, Parma Heights, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 210,143, Dec. 20, 1971, abandoned. This application Nov. 7, 1973, Ser. No. 413,713
Int. Cl.[2] H01B *1/06;* H01C *1/06*
U.S. Cl. 252—518 10 Claims

1. A solid ionically conductive ternary composition containing 20% to 95% (molar percentage) silver iodide, the remainder being MI and $MAg(CN)_2$ wherein M is potassium or rubidium or mixtures thereof and the molar proportion of MI to $MAg(CN)_2$ is between about 1.5 to 1 and about 7 to 1.

3,957,697

PROCESS FOR SLURRY POLYMERIZATION OF PROPYLENE OXIDE WITH HIGH CATALYST EFFICIENCY

Robert K. Schlatzer, Chagrin Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 24, 1974, Ser. No. 517,457
Int. Cl.[2] C08G *65/08, 65/10, 65/30*
U.S. Cl. 260—2 A 12 Claims

1. A slurry polymerization process comprising (A) polymerizing propylene oxide and up to about 40% by weight of the total monomer mixture of at least one other oxirane monomer, polymerization being conducted in isobutane in the presence of a catalyst substantially soluble in isobutane, (B) separating isobutane with catalyst dissolved therein from polymer, and (C) recycling isobutane and dissolved catalyst for further polymerization, said catalyst comprising (1) at least one trialkylaluminum compound wherein each alkyl group contains from 2 to 10 carbon atoms, (2) at least one diketone containing from 5 to 20 carbon atoms in an amount from about 0.3 mole to 1 mole per mole of said trialkylaluminum compound, and (3) water in an amount from about 0.3 mole to about 1 mole per mole of said trialkylaluminum compound.

3,957,698

THERMALLY REVERSIBLE, AMPHOTERIC ION EXCHANGE RESINS CONSISTING OF CROSSLINKED MICROBEADS EMBEDDED IN CROSSLINKED MATRIX OF OPPOSITE EXCHANGE GROUP TYPE

Melvin J. Hatch, Socorro, N. Mex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 5, 1974, Ser. No. 521,114
Int. Cl.[2] C08F *257/02*
U.S. Cl. 260—2.1 R 18 Claims

1. A thermally reversible, heterogeneous, amphoteric ion exchange resin in particulate form consisting essentially of:

A. Microbead particles of a weak acid cation or weak base anion exchange resin having about 0.5 –10 percent crosslinking and a particle size of about 0.1 –10 microns, and

B. A matrix of a weak base anion or weak acid cation exchange resin, opposite in type to the microbead resin, and having about 0.5–10 percent crosslinking,

said microbead resin A being incorporated in the matrix resin B to give a composite amphoteric resin having a particle size of about 0.074–4.00 millimeters and a ratio of about 0.5–2.0 meq weak base anion exchange capacity per meq weak acid cation exchange capacity.

3,957,699

PROCESS FOR POLYMERIZING ALLYLAMINES EMPLOYING A REDOX INITIATOR CONSISTING OF FE^{++} OR TI^{+++} WITH H_2O_2, HYDROXYL AMINE, OR HYDROPEROXIDES TO FORM INSOLUBLE CROSSLINKED POLYMERS

David Henry Solomon, Glen Waverley, and Colin Douglas McLean, Mulgrave, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed June 4, 1974, Ser. No. 476,274
Claims priority, application Australia, June 12, 1973, 3612/73
Int. Cl.[2] C08F *120/52;* C08J *5/20;* C08F *218/00, 120/70*
U.S. Cl. 260—2.1 E 10 Claims

1. A method of manufacturing a water insoluble crosslinked weakly basic ion exchange polymer comprising polymerizing in the presence of a free radical initiator which is soluble in the reaction mixture, which yields only uncharged non-polar fragments and which is a redox system of a transition metal selected from the group consisting of Fe^{++} and Ti^{+++} with hydrogen peroxide, hydroxyl amine or an organic hydroperoxide, and at a temperature between −20° and 80°C and at a pH between 0 and 5, in the absence of oxygen, (1) an allylamine salt of a strong acid, said allylamine containing

three allyl groups, (2) an allylamine salt of a strong acid, said allylamine containing two allyl groups with a cross-linking agent chosen from the group consisting essentially of strong acid salts of a triallyl amine, strong acid salts of bis (diallylamino) alkane, ethylene glycol dimethacrylate, 1,3-butylene glycol dimethacrylate, divinyl benzene, triallyl cyanurate and the triallyl ether of pentaerythritol, or (3) an allylamine salt of a strong acid, said allylamine containing three allyl groups with a cross-linking agent of the group consisting essentially of strong acid salts of bis (diallylamino) alkane, ethylene glycol dimethacrylate, 1,3-butylene glycol dimethacrylate, divinyl benzene, triallyl cyanurate and the triallyl ether of pentaerythritol.

3,957,700
FILLED AMINOPLAST MOULDING MATERIALS

John E. Ferriday, Stourbridge; Brian J. Kendall-Smith, Birmingham, and Michael L. Bradley, Netherton, all of England, assignors to British Industrial Plastics Limited, Manchester, England

Continuation-in-part of Ser. No. 356,798, May 3, 1973, abandoned. This application July 23, 1974, Ser. No. 491,135
Claims priority, application United Kingdom, May 4, 1972, 20815/72
Int. Cl.² C08J *9/00*
U.S. Cl. 260—2.5 F **9 Claims**

1. A thermosetting moulding composition including an amino-formaldehyde resin and a filler composed of α-cellulose dispersed therein, at least about 9% by weight of said filler replaced by a particulate, disintegrated, cured, unfilled amino-formaldehyde foam material having an absorbency of less than 2.0 milliliters of water per gram, wherein the weight ratio of the particulate, cured foam filler to the cellulose filler is within the range of from 1:10 to 10:1.

3,957,701
AMINOPLAST MOULDING MATERIALS WITH CURED AMINOPLAST FILLER

Nigel A. Cutler, Barnt Green, and Michael L. Bradley, Netherton, both of England, assignors to British Industrial Plastics Limited, Manchester, England

Continuation of Ser. No. 337,538, March 2, 1973, abandoned. This application Aug. 27, 1974, Ser. No. 501,191
Claims priority, application United Kingdom, Mar. 4, 1972, 10196/72
Int. Cl.² C08J *9/00*
U.S. Cl. 260—2.5 F **3 Claims**

1. A thermosetting moulding composition including an amino-formaldehyde resin and a filler composed of α-cellulose dispersed therein, at least about 30% by weight of said filler replaced by an unfilled amino-formaldehyde material having an absorbency of at least 2.0 milliliters of water per gram and selected from the group consisting of amino-formaldehyde in the form of disintegrated foams and amino-formaldehyde materials formed as precipitates from solution, the ratio of resin to filler being from 6:1 to 1:1.

3,957,702
FLAME RETARDANT POLYURETHANE FOAMS

Hyman Max Molotsky, Chicago, Ill., and Robert Eugene Gramera, Denver, Colo., assignors to CPC International Inc., Englewood Cliffs, N.J.

Continuation-in-part of Ser. No. 637,364, May 10, 1967, abandoned. This application Sept. 8, 1971, Ser. No. 178,796
Int. Cl.² C08G *18/50, 18/14*
U.S. Cl. 260—2.5 AR **10 Claims**

1. A polyurethane resin comprising the reaction product of an organic di- or tri-isocyanate having no other reactive functional groups and a phosphorus-containing intermediate which is prepared by reacting an inorganic phosphoric acid with a starch polyether which is in turn prepared by the reaction of starch with an alkylene oxide of 2–5 carbon atoms, said starch polyether having an average of from about 3.5 to about 50 alkylene oxide units per anhydroglucose unit, or hydrolysate thereof having at least about 10 anhydroglucose units.

3,957,703
PLYWOOD ADHESIVE AND USE THEREOF

Charles H. Ludwig, Bellingham, Wash.; Albert W. Stout, deceased, late of Bellingham, Wash., by Zelda M. Stout, executor, Bellingham, Wash., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Filed Feb. 25, 1974, Ser. No. 445,624
Int. Cl.² C09J *3/28*
U.S. Cl. 260—17.5 **10 Claims**

1. In a phenol-aldehyde plywood adhesive, the improvement of using as an extender, a water-insoluble, acid polymerized lignosulfonate.

3,957,704
CROSS-LINKING AGENTS FOR ROOM TEMPERATURE VULCANIZABLE SILICONE RUBBER COMPOSITIONS

Robert A. Smith, Schenectady, and Richard P. Surprenant, Troy, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Dec. 19, 1974, Ser. No. 534,295
Int. Cl.² C08L *91/00*
U.S. Cl. 260—18 S **22 Claims**

1. A cross-linking agent for room temperature vulcanizable silicone rubber compositions comprising the reaction product of 25 to 75 parts of a silicate selected from the class consisting of silicates of the formula,

$$R_a^3Si(OR^1)_{4-a},$$

and a liquid partial hydrolysis product of the aforementioned alkyl silicates and 10 to 40 parts of a polysiloxane fluid of the formula,

$$R_a^3SiO_{4-a/2},$$

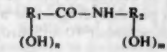
where the polysiloxane fluid is chain-stopped with mixtures of —OH groups and $R_3^3SiO_{1/2}$ units, where the ratio of the $R_3^3Si-O_{1/2}$ units to —OH groups in the fluid varies from 3:1 to 1:1 and a metal salt of an acid selected from the class consisting of monocarboxylic acid and dicarboxylic acid and the metal ion is selected from the class consisting of lead, tin, zirconium, antimony, iron, cadmium, barium, calcium, titanium, bismuth and manganese, where R^1, R^2 and R^3 are selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals and mixtures thereof, a is 0 or 1, and varies from 1.9 to 2.1.

3,957,705
ANTI-FOAMING AGENT COMPOSITIONS

Jürgen Gärtner, Haan; Rudi Heyden, Hochdahl-Millrath; Michael Eckelt, Dusseldorf-Benrath; Heinz Linden, Dusseldorf-Holthausen; Hans Bornmann, Dusseldorf-Holthausen, and Arnold Heins, Hilden, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Apr. 24, 1974, Ser. No. 463,617
Claims priority, application Germany, Apr. 30, 1973, 2321755
Int. Cl.² C09D *5/02*; C09F *1/04*
U.S. Cl. 260—22 R **12 Claims**

1. A stable aqueous synthetic resin or natural resin dispersion containing from 0.05% to 5% by weight based on the weight of said synthetic resin or natural resin dispersion of an anti-foaming agent composition comprising a dispersion in a liquid selected from the group consisting of water and organic liquids of from 1% to 50% by weight of said dispersion of a carboxylic acid -N-alkylamide having the formula



wherein R_1 and R_2 are alkyls having from 10 to 26 carbon atoms, n and m are integers from 0 to 2, with the proviso that one of n or m is other than 0.

3,957,706
MOLDING COMPOSITION

Ronald R. Light; Theodore F. Gray, Jr., and Frederick B. Joyner, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 439,161, Feb. 4, 1974, abandoned, and a continuation-in-part of Ser. No. 439,162, Feb. 4, 1974, abandoned. This application Jan. 27, 1975, Ser. No. 544,447

Int. Cl.² C08L *91/00;* **C08G** *63/66, 63/70*

U.S. Cl. 260—22 R **10 Claims**

1. A composition comprising an admixture of

A. from 0.5 to 5 weight percent, based on the total weight of the composition, of a sodium salt of a linear or branched saturated or unsaturated aliphatic monocarboxylic acid having 3 to 22 carbon atoms, and

B. from 99.5 to 95 weight percent, based on the total weight of the composition, of a polyetherester having an inherent viscosity of at least 0.4 measured at about 25°C. using 0.5 percent of the polyetherester in a solvent composed of 60 percent by weight of phenol and 40 percent by weight of tetrachloroethane, comprised of the polymeric condensation product of

1. a dicarboxylic acid component comprised of
   a. 100–60 mole percent terephthalic acid, and
   b. 0–40 mole percent of an aliphatic or aromatic dicarboxylic acid having a molecular weight of less than 300, and
2. a diol component comprised of
   a. a glycol comprised of 100–60 mole percent tetramethylene glycol and 0–40 mole percent of an aliphatic or aromatic glycol having a molecular weight of less than 300, and
   b. 10–60 weight percent, based on the weight of the polyetherester, of a poly(alkylene oxide) glycol having 2, 3, or 4 carbon atoms in the repeating unit and having a molecular weight in the range of 400 to 5,000,

wherein the sum of the total mole percent amount of aliphatic or aromatic dicarboxylic acid having a molecular weight of less than 300 in part (B)(1)(b), the mole percent amount of aliphatic or aromatic glycol having a molecular weight of less than 300 in part (B)(2)(a) and the weight percent, based on the weight of the polyetherester, of the poly(alkylene oxide) glycol in part (B)(2)(b) equals at least 35 but does not exceed 80.

3,957,707
ACRYLIC COMPOSITION AND FILM

William A. Watts, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 21, 1974, Ser. No. 481,611

Int. Cl.² C08L *97/00*

U.S. Cl. 260—23 AR **4 Claims**

1. A film made from the polymer resulting from the reaction of from 40 to 80 parts of an acrylate selected from at least one of the group consisting of alkyl acrylate and alkyl methacrylate wherein the alkyl group contains from 2 to 10 carbon atoms, and from 20 to 60 parts of a vinyl nitrile wherein the film contains a combination of antiblocking and antifogging agents selected from the combinations of (1) sorbitan monolaurate and sorbitan monostearate, (2) sorbitan monolaurate, sorbitan monostearate and polyoxyethylene sorbitan monolaurate, (3) sorbitan monolaurate, sorbitan monostearate and polyoxyethylene sorbitan monopalmitate, (4) sorbitan monolaurate, sorbitan monostearate and polyoxyethylene sorbitan monooleate, (5) sorbitan monopalmitate and sorbitan monostearate, (6) sorbitan monopalmitate, sorbitan monostearate and polyoxyethylene sorbitan monolaurate, (7) sorbitan monopalmitate, sorbitan monostearate and polyoxyethylene sorbitan monopalmitate, and (8) sorbitan monopalmitate, sorbitan monostearate and polyoxyethylene sorbitan monooleate.

3,957,708
METAL COATING COMPOSITIONS PREPARED FROM AQUEOUS DISPERSIONS OF VINYL CHLORIDE/ALKENE COPOLYMERS

Vishnu P. J. Gor, Country Club Hills, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed May 26, 1972, Ser. No. 257,269

Int. Cl.² C08L *61/20*

U.S. Cl. 260—29.4 UA **4 Claims**

1. A dispersion composition comprised of a vehicle dispersed in water, the vehicle comprising about 40 to about 70% by weight of the dispersion and comprised of

a. about 70 to 95 percent by weight of a vinyl chloride/alkene copolymer comprised of about 70 to 99 percent by weight vinyl chloride and about 1 to 30 percent by weight of an alkene having 2 to 4 carbon atoms,

b. about 5 to about 20 percent by weight of a methylolated ethyleneurea resin prepared from a reaction mixture comprised of an ethyleneurea and an aldehyde, and

c. about 1 to about 10 percent by weight of an alkylated triazine aldehyde condensate prepared by the reaction of an aminotriazine and an aldehyde in the presence of a monohydroxyl alcohol.

3,957,709
WATER-SOLUBLE ESTER INTERMEDIATES AND WATER-INSOLUBLE COATINGS MADE THEREFROM

Edward J. Holzrichter, Riverside, and Edward A. Lasher, Beverly Hills, both of Calif., assignors to Whittaker Corporation, Los Angeles, Calif.

Filed Sept. 20, 1974, Ser. No. 507,746

Int. Cl.² C08L *61/26;* **C08G** *12/32*

U.S. Cl. 260—29.4 R **10 Claims**

1. A method of making a water-based coatings composition comprising the steps of:

admixing an amount of (a) an aliphatic polyol having a hydroxyl functionality of 2 to 3 with an amount of (b) a polycarboxylic acid having a carboxyl functionality of 2 to 3 to provide a molar ratio of said (a) to said (b) of one mol of said (a) per carboxyl group of said (b) and an equivalents ratio of said (a) to said (b) so that said ester intermediate has a hydroxyl functionality of about 3, said polyol having a hydroxyl functionality of 3 also having a carbon/oxygen ratio between about 5:3 and 7:3;

heating the admixture of said (a) and (b) to esterify said (a) and (b);

continuing said heating until an acid number below about 20 is obtained to produce a water-soluble ester intermediate;

admixing said ester intermediate with an amount of a water-soluble aminoplast resin sufficient to produce a substantially water-insoluble cured coating and with a solvent for said ester resin and said aminoplast resin with water comprising at least a substantial portion of said solvent, to produce a heat-curable solution; and

dissolving an epoxy resin in said ester intermediate before esterification of said ester intermediate with said aminoplast resin, with said epoxy resin comprising up to about 10% by weight of the total weight of said ester intermediate and said aminoplast resin.

3,957,710

PAPER COATING COMPOSITIONS FROM POLYMERS OF OLEFINICALLY UNSATURATED MONOMERS

Michael Ernst Rohmann, Bad Duerkheim, and Kurt Wendel, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

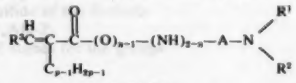
Continuation of Ser. No. 353,620, April 23, 1973, abandoned. This application Sept. 18, 1974, Ser. No. 507,368

Claims priority, application Germany, Apr. 26, 1972, 2220443

Int. Cl.² C09D *5/02, 3/80;* C08L *39/04, 35/00*

U.S. Cl. 260—29.6 TA 4 Claims

1. A paper coating composition comprising a finely divided pigment, and 2–25 parts by weight, per 100 parts by weight of said finely divided pigment, of a synthetic polymer binder composition containing, in aqueous dispersion, from 30 to 60% by weight based on the dispersion, of a copolymer consisting of (*a*) from 5 to 30% by weight of mono-olefinically unsaturated carboxylic acids selected from the group consisting of C_{3-5} mono- and di-carboxylic acids and C_{5-9} monoalkyl esters of C_{4-5} dicarboxylic acids, (*b*) from 5 to 30% by weight of monomers of the general formula:



in which A is a C_{2-6} hydrocarbon radical, R^1 and R^2 are each individually hydrogen atoms or C_{1-6} hydrocarbon radicals or R^1 and R^2 form, together with the N atom, a heterocyclic ring, R^3 is hydrogen or methyl and n and p are each 1 to 2, and (*c*) from 50 to 80% by weight of monomers selected from the group consisting of C_{4-8} mono-olefinically unsaturated carboxylates and styrene.

3,957,711

DISPERSION POLYMERIZATION PROCESS USING HYDROXYALKYL ACRYLATE AS PROTECTIVE COLLOIDS

Thomas M. Powanda, Middlesex; Ralph F. Patella, S. Plainfield, So. Plainfield, and Edward J. Kuzma, Woodbridge, all of N.J., assignors to Celanese Coatings & Specialties Company, Louisville, Ky.

Filed Dec. 20, 1974, Ser. No. 534,941

Int. Cl.² C08F *2/20*

U.S. Cl. 260—29.6 RW 10 Claims

1. In the process for preparing a stable dispersion of polymers of ethylenically unsaturated monomers selected from the group consisting of vinyl esters of organic acids having two to eighteen carbon atoms, esters of polymerizable unsaturated mono and polycarboxylic acids wherein the ester group contains one to eighteen carbon atoms and the acid contains three to 10 carbon atoms and mixtures thereof which comprises reacting at a temperature of about 50°C. to about 90°C. a dispersion of said monomers in water using about 75 to about 125 parts by weight of water per 100 parts of weight of monomers in the presence of a protective colloid and an anionic or nonionic surfactant or mixture thereof with a free radical polymerization catalyst under polymerization conditions, the improvement which comprises using as the protective colloid in the amount of about 0.2 to about 2 weight percent based on the total weight of the dispersion a polymer of a hydroxyalkyl acrylate or methacrylate wherein the alkyl group contains 2 to 4 carbon atoms.

3,957,712

USE OF A HYDROPHILIC PLASTICIZER FOR PLASTIC DISPERSIONS AND PASTES

Rudi Heyden, Hochdahl-Millrath; Michael Eckelt, Dusseldorf; Karl Mahall, Monheim, Baumberg, and Wilfried Kuper, Dusseldorf, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusselforf, Germany

Filed Aug. 20, 1974, Ser. No. 498,998

Claims priority, application Germany, Aug. 27, 1973, 2343198

Int. Cl.² C08K *5/11*

U.S. Cl. 260—31.4 R 10 Claims

6. A dispersion consisting essentially of about 40% to 60% by weight of a thermoplastic polymer and an effective amount of plasticizer in the range of about 2% to 15% by weight of a C_{12-22} fatty acid diester of a polyglycol having a molecular weight of 2,000 to 4,000, said polyglycol being composed of 40% to 50% by weight of ethoxy units and 60% to 50% by weight of propoxy units.

3,957,713

HIGH STRENGTH ORGANOPOLYSILOXANE COMPOSITIONS

Edward M. Jeram, Burnt Hills, and Richard A. Striker, Troy, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

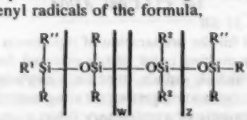
Continuation of Ser. No. 351,107, April 13, 1973, Pat. No. 3,884,866. This application Aug. 12, 1974, Ser. No. 496,752 The portion of the term of this patent subsequent to May 20, 1992, has been disclaimed.

Int. Cl.² C08K *5/07*

U.S. Cl. 260—32.8 SB 9 Claims

1. A process for producing organopolysiloxane elastomers having high strength with exceptionally good elongation comprising (a) mixing per 100 parts of a mixture which is formed by mixing (i) 20 to 90 parts of a polymer selected from the class consisting of vinyl-containing high viscosity organopolysiloxane and a blend of vinyl-containing high viscosity organopolysiloxane having no more than 25 mole percent of phenyl radicals and having a viscosity of 5,000 to 500,000 centipoise at 25°C of the formula,

where Vi stands for vinyl, R^1 is selected from the class consisting of lower alkenyl, alkyl and aryl radicals, and R is selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, R^2 is selected from the class consisting of alkyl and aryl radicals, *x* varies from 100 to 10,000, *y* varies from 0 to 300; (ii) from 5 to 40 parts of a polymer selected from the class consisting of a low viscosity vinyl-containing organopolysiloxane and a blend of low viscosity vinyl-containing organopolysiloxanes having a vinyl content that may vary from 0.01 mole percent to 60 mole percent vinyl and a viscosity that varies from 50 to 50,000 centipoise at 25°C and having no more than 25 mole percent phenyl radicals of the formula,



wherein R^1, R^2 and R are as previously defined, R'' is selected from the class consisting of alkyl, aryl, and alkenyl radicals, *w* varies from 0 to 500 and *z* varies from 0 to 200; (iii) from 5 to 70 parts of a filler; (iv) from 0.1 to 100 parts per million of the total composition of a platinum catalyst, and there is mixed as aforesaid into 100 parts of the above mixture, 1 to 100 parts of a hydride silicone compound selected from the class consisting of hydrogen containing silanes and hydrogen

containing polysiloxanes and mixtures thereof; and (b) allowing the mixtures to cure at a temperature in the range of 20° to 300°C.

3,957,714

METHOD FOR MAKING PAINTABLE SILICONE SURFACES AND ELASTOMER

William H. Clark, and Robert D. Johnson, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed May 19, 1975, Ser. No. 578,708
Int. Cl.² C08K 5/01
U.S. Cl. 260—33.6 SB 10 Claims

1. A method of forming a paintable silicone rubber surface comprising

I. mixing under substantially anhydrous conditions below a temperature of about 60°C. and under shear conditions which do not substantially alter filler structure,

A. 100 parts by weight of a hydroxyl endblocked polydimethylsiloxane having a viscosity of from 2500 cps. at 25°C. up to and including non-flowable gums having from 0 to 40 percent inclusive of the total end groups as trimethylsiloxy units,

B. from 70 to 150 parts by weight of a finely divided, agglomerated precipitated acicular calcium carbonate,

C. from 35 to 200 parts by weight of a organic solvent selected from the group consisting of aliphatic hydrocarbons, chlorinated aliphatic hydrocarbons, ketones, aromatics, esters, ethers and mixtures thereof, said organic solvent being a solvent for the silicon-containing species defined herein and having an evaporation rate such that said organic solvent is substantially evaporated within a 48 hour period,

D. from 12 to 20 parts by weight of a monoalkyltriacetoxysilane where the alkyl radical has from 1 to 4 carbon atoms per radical and

E. a catalytic amount of an organotin carboxylate, obtaining a curable mixture storable under anhydrous conditions,

II. exposing said curable mixture to atmospheric conditions,

III. allowing the organic solvent to evaporate, after the organic solvent has evaporated and the curable mixture has cured to coherent solid elastomeric material, any exposed surface of said coherent solid elastomeric material is paintable with at least one type of decorative organic base paint which forms a continuous coating over the surface of said coherent solid elastomeric material and said continuous coating adheres to the surface of said coherent solid elastomeric material.

3,957,715

CASTING OF HIGH MELTING POINT METALS AND CORES THEREFOR

Nick G. Lirones, and David H. Sturgis, both of North Muskegon, Mich., assignors to Howmet Corporation, Greenwich, Conn.

Continuation of Ser. No. 322,421, Jan. 10, 1973, abandoned. This application Nov. 21, 1974, Ser. No. 525,999
Int. Cl.² C08L 83/04
U.S. Cl. 260—37 SB 31 Claims

1. A method for the preparation of rigid cores for use in the casting of high melting point metals selected from the group consisting of nickel, cobalt, titanium, zirconium, hafnium, niobium and tungsten comprising forming a core composition consisting essentially of a refractory filler, a curable silicone resin and a catalyst system to cure the silicone resin consisting essentially of a catalyst selected from the group consisting of an anhydride of an organic carboxylic acid and a mixture of an anhydride of an organic carboxylic aicd and magnesium oxide into a core configuration, and baking and firing the core configuraion to effect cure of the silicone resin and to convert the silicone resin into a siliceous material to bond the filler and define a dimensionally stable, rigid core.

3,957,716

SIZED CARBON FIBERS

Winfred E. Weldy, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 402,493, Oct. 1, 1973, Pat. No. 3,914,504. This application Mar. 3, 1975, Ser. No. 554,998
Int. Cl.² C08L 63/02
U.S. Cl. 260—37 EP 4 Claims

1. A composite structure comprising a cured epoxy resin matrix containing carbon fibers having coated on the surface thereof from about 0.4 to about 5.0% by weight, based on the weight of the fiber, of a sizing composition selected from the group consisting of polyglycidyl ethers, cycloaliphatic polyepoxides and mixtures thereof.

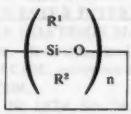
3,957,717

ORGANOPOLYSILOXANE COMPOSITIONS

Naohiko Harada, and Masaki Tanaka, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1975, Ser. No. 565,209
Claims priority, application Japan, Apr. 8, 1974, 49-39650
Int. Cl.² C08L 83/04
U.S. Cl. 260—37 SB 14 Claims

1. An organopolysiloxane composition comprising (a) a cyclic diorganosiloxane polymer represented by the general formula



where R^1 and R^2 each are selected from substituted or unsubstituted monovalent hydrocarbon groups and n is an integer from 3 to 5 and containing at least two unsaturated hydrocarbon groups in a molecule, (b) an organopolysiloxane consisting of $R_3{}^3SiO_{0.5}$ and SiO_2 units in a ratio of from 0.6 to 1.2 moles of $R_3{}^3SiO_{0.5}$ per mole of SiO_2 where R^3 is a monovalent hydrocarbon group, at least 60% in number thereof being methyl groups, (c) a liquid organohydrogenpolysiloxane represented by the average unit formula

$$R_a{}^4H_bSiO_{\frac{4-a-b}{2}}$$

where R^4 is a substituted or unsubstituted monovalent hydrocarbon group, a is a positive number from 1 to 2 and b is a positive number from 0.1 to 1.2 with the proviso that 1.8 $(a+b)$ 3.0 and containing at least two hydrogen atoms directly bonded to the silicon atoms in a molecule in an amount sufficient to give from 0.5 to 2.0 hydrogen atoms directly bonded to the silicon atoms per one unsaturated hydrocarbon group in components (a) and (b), (d) a catalytic amount of platinum or a platinum compound, and (e) a filler, the amount of component (b) being in the range of from 20 to 500 parts by weight based on 100 parts by weight of components (a) and (c) and the amount of component (e) being in the range of from 10 to 500 parts by weight based on 100 parts by weight of components (a), (b), and (c).

3,957,718

COMPOSITIONS CONTAINING SILICA, A PHENOPLAST OR AN AMINOPLAST, AND A SILANE

Johannes Pochert, Walberberg; Siegfried Wolff, Bornheim-Merten, and Friedrich Thurn, Rodenkirchen, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed Dec. 26, 1974, Ser. No. 536,478

Claims priority, application Germany, Jan. 10, 1974, 2401056

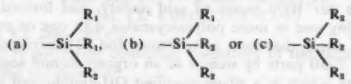
Int. Cl.² C08K 3/36, 5/54, 9/06; C08L 61/06

U.S. Cl. 260—38 25 Claims

1. A silica containing composition for the improvement of the adhesion of a vulcanizable mixture of natural or synthetic rubber to reinforcing fillers or supports of textile or metallic fabrics after the vulcanization which comprises, (A) a siliceous filler which is an active synthetically produced silica or silicate having a specific surface area according to the BET procedure of about 50 to 500 m²/g and an average primary particle size of from about 5 to 100 microns, (B) phenolic resin or aminoplast forming components, incluidng (1) a phenol or an amine and (2) an aldehyde or aldehyde donors, and (C) an oganosilane which is either (1) a bis-alkoxy-silyalkyl-oligosulfide of the formula

Z-Alk-S_nAlk-Z, I

in which Z stands for the groups



in which R_1 is an alkyl group with 1 to 4 carbon atoms or the phenyl group and R_2 is an alkoxy group with 1 to 8 carbon atoms, a cycloalkyl group with 5 to 8 carbon atoms or an alkylmercapto group with 1 to 8 carbon atoms, Alk is a divalent hydrocarbon group with 1 to 18 carbon atoms, n is a number of 2 to 6,

Z-Alk-SH II

in which Z and Alk are as defined in formula I, or the organosilane can have the general formula

Z-Alk-A III

wherein Z and Alk are as defined in formula I and A is the group

a. N≡C-S,
b. R-S-,
c. RO-CS-S,
d. RS-CS-S-, or
e. R_3S-CS-S-,

Where R and R_3 are monovalent hydrocarbon groups, heterocyclic or heteroaromatic groups with 1 to 15 carbon atoms and 1 to 5 heteroatoms from the group of nitrogen, oxygen and sulfur and wherein in formula III(e) R_3 can be

wherein R_4 and R_5 are hydrogen, alkyl of 1 to 5 carbon atoms, benzyl, cycloalkyl with 5 to 7 carbon atoms or both together with the nitrogen atom form a ring having 5 to 8 carbon atoms with up to one further nitrogen, oxygen or sulfur atom, the total of (B) and (C) being 3 to 100% of (A) and (B) is 10 to 90% of the total of (B) and (C).

3,957,719

METHOD OF HEAT TREATING AN ETHYLENE CONTAINING POLYMER ELECTRICAL INSULATING COMPOSITION AND PRODUCT FORMED THEREBY

Burton Thornley MacKenzie, Jr., Monroe, Conn., assignor to General Electric Company, New York, N.Y.

Filed Aug. 8, 1974, Ser. No. 495,866

Int. Cl.² C08K 5/54, 5/01; B29F 3/10; B29B 3/00

U.S. Cl. 260—42.42 23 Claims

6. A method of manufacturing electrical cable comprising a metallic conductor and an insulating covering thereabout including a clay-filled, thermoset ethylene-containing polymer material having a power factor of less than about 0.75%, comprising the steps of:

a. admixing a compound comprising an ethylene-containing polymer comprising at least about 50 mole percent ethylene, clay filler, an organoalkoxysilane in an amount of about 1 to about 5 parts by weight per 100 parts by weight of clay, and an organic peroxide curing agent;
b. heat treating the admixed compound comprising the polymer, clay, organoalkoxysilane and curing agent in particulate form by heating to a temperature of about 120°F to about 200°F for a period of approximately 48 to approximately 120 hours;
c. molding the heat treated admixed compound as a continuum surrounding the conductor; and
d. curing the molded and heat treated admixed compound to a thermoset state by heating it to a temperature of within the approximate range of about 300°F to about 400°F.

3,957,720

PROCESS FOR IMPARTING FLAME RESISTANCE TO COMBUSTIBLE MATERIAL

Ludwig Maier, Kilchberg, Switzerland, assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 26, 1974, Ser. No. 501,009

Claims priority, application Switzerland, Sept. 5, 1973, 12731/73

Int. Cl.² C08K 5/49

U.S. Cl. 260—45.7 R 10 Claims

6. A composition of matter comprising a polymer selected from the group consisting of nylon 66, polyethylene terephthalate and polystyrene containing as an additive from about 1 to 30% by weight, based on the weight of the polymer plus, additive of an additive having the formula

wherein R^1, R^2, R^3 and R^4 are hydrocarbon groups having a total of up to 10 carbon atoms, and two of these groups when taken together form a corresponding phosphorus-containing ring.

3,957,721

STABILIZER COMBINATIONS OF (β-AMINOACRYLYL) COMPOUNDS AND PHENOLIC COMPOUNDS AND STABILIZED COMPOSITIONS THEREOF

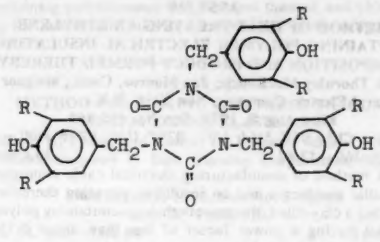
Ronald G. Getts, Cleveland, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 2, 1974, Ser. No. 494,093

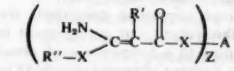
Int. Cl.² C08R 5/00

U.S. Cl. 260—45.8 N 12 Claims

1. A stabilized polymer composition comprising (A) a polyolefinic polymer and (B) a stabilizer combination consisting essentially of (1) a phenolic stabilizer of the formula



wherein R is H or an alkyl group of 1 to 9 carbon atoms where at least one R must be an alkyl group and (2) a (β-aminoacrylyl) compound of the structure



wherein X is sulfur or oxygen; R′ is hydrogen or a methyl or ethyl radical; R″ is selected from the group consisting of alkyl groups containing 1 to about 24 carbon atoms, aryl groups containing 6 to about 18 carbon atoms, and ester groups containing 3 to about 24 carbon atoms total in the group; A is selected from the group consisting of alkyl groups containing 1 to about 24 carbon atoms in the group, alkylene groups containing 1 to about 18 carbon atoms in the group, and the defined group

$$-(CH_2)_n-R_4-(CH_2)_n-$$

where n is 0 to 6 and R_4 is a benzene radical, a naphthalene radical, or a cycloalkyl radical containing 5 to 8 carbon atoms in the ring; and Z = 1 when A is an alkyl group and Z = 2 when A is an alkylene group or the defined group.

3,957,722

FLAME-RESISTANT POLYBUTADIENE RESIN

David F. Lawson, and Delmar F. Lohr, Jr., both of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 376,486, July 5, 1973, abandoned. This application Jan. 16, 1975, Ser. No. 541,531

Int. Cl.² C08J *3/20*

U.S. Cl. 260—45.75 W **3 Claims**

1. A peroxide-cured or peroxide-curable polybutadiene polymer or copolymer with styrene resin which includes as a flame-retarding agent, per 100 parts by weight of the resin, (1) substantially 10 parts by weight of tetrabromobenzene and (2) substantially 0.5 to 2 parts of zinc -0,0- dihydrocarbyl phosphorodithioate in which the hydrocarbyl group is an alkyl group containing from 1 to 20 carbons, said resin being from the class consisting of homopolymers of butadiene and copolymers of butadiene and styrene containing at least 40 per cent by weight of butadiene, the ratio of the atoms of bromine to the atoms of metal being at least substantially 2 to 1, and at least 80 percent by weight of the butadiene repeating units in the homopolymer or copolymer being in the 1,2 configuration.

3,957,723

FLAME AND SMOKE RETARDANTS FOR POLYVINYL CHLORIDE

David Francis Lawson, and Edward Leo Kay, both of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed June 27, 1975, Ser. No. 591,254

Int. Cl.² C08J *3/20*

U.S. Cl. 260—45.75 W **3 Claims**

1. Polyvinyl chloride which contains 6 to 150 parts by weight of aluminum oxide trihydrate and 1 to 25 parts by weight of zinc oxide, with the ratio of zinc oxide to aluminum oxide trihydrate of substantially 1 to 30, per 100 parts by weight of the vinyl chloride.

3,957,724

STRATUM HAVING RELEASE PROPERTIES AND METHOD OF MAKING

Frank A. Schurb, and Jack L. Evans, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 11, 1973, Ser. No. 423,706

Int. Cl.² C08G *77/04*

U.S. Cl. 260—46.5 E **4 Claims**

1. As a new article of manufacture, having particular utility in affording accurately predictable and controllable release for a wide variety of normally tacky and pressure-sensitive adhesive sheet materials,

a self-supporting sheet material capable of being wound convolutely upon itself in roll form, said sheet material having, at least at one exposed surface, a stratum which is

the solid, crosslinked, substantially insoluble joined interpenetrating polymeric network reaction product of starting materials consisting essentially of (1) 98–50 parts by weight of a first moiety terminated with from more than 1 to not more than 3 isocyanate groups, liquid at 60°C., having an NCO equivalent weight of at least about 100, containing not more than 5 urethane or urea gram equivalents per 1000 grams of said moiety, and formed by reacting one or more polyisocyanates with one or more diols, triols, diamines, or triamines and (2) correspondingly 2–50 parts by weight of an organosilicone second moiety which is a silane-modified OH-endblocked predominantly dimethyl-substituted linear polysiloxane, is liquid at 20°C., and has a plurality of active hydrogen atoms each chemically bonded to a nitrogen or oxygen atom which is attached to an aliphatic radical and is at least 3 carbon atoms distant from the nearest silicon atom, said nitrogen or oxygen atoms constituting no more than about 4% by weight of said organosilicone moiety.

3,957,725

ACTIVE MATRIX AND INTRINSIC PHOTOCONDUCTIVE POLYMER

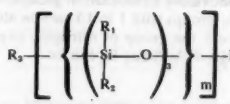
William W. Limburg, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 357,987, May 7, 1973, Pat. No. 3,899,328. This application Sept. 27, 1974, Ser. No. 509,774

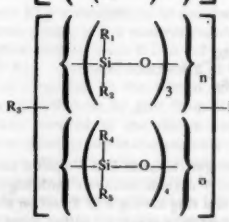
Int. Cl.² C08G *77/04*

U.S. Cl. 260—46.5 R **9 Claims**

1. A polysiloxane represented by the formulae



or



wherein

R_1 is defined as a lower alkyl, a lower alkoxy, or lower alkyl carbonyloxy group;

R_2 is defined as a monovalent aromatic polycyclic radical having four fused ring nuclei or a member selected from the group consisting of a perylene, carbazole, benzcarbazole, indole, dibenzofuran or dibenzothiophene group;

R_3 is defined as a polymeric end group;

R_4 and R_5 are individually defined as a lower alkyl group;

R_6 is defined as a polymeric end group; and

m, *n* and *o* are positive numbers commensurate with a molecular weight of at least 1000, the products (3) (*n*) and (4) (*o*) having a numerical ratio of about 3:1 to 1:8.

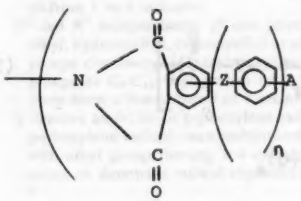
3,957,726

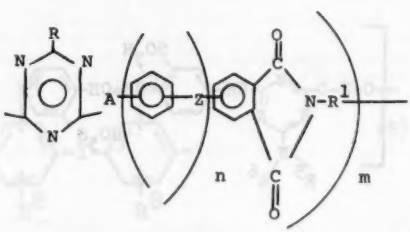
S-TRIAZINE-IMIDE COPOLYMERS

David A. Gordon, Scarsdale, and Raymond Seltzer, New City, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 17, 1974, Ser. No. 489,227
Int. Cl.² C08G *73/08, 73/10*
U.S. Cl. 260—47 CP **12 Claims**

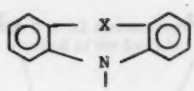
1. A polyimide consisting essentially of the recurring unit having the structure



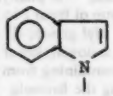


wherein

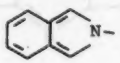
R is hydrogen, alkyl, cycloalkyl, aryl, aryl substituted with nitro, halo, carboxyl, cyano, lower alkyl, hydroxy, aryl, or lower alkoxy of up to 4 carbon atoms, aralkyl, amino, diarylamino, di(lower)alkylamino, alkylamino, anilino, N-(lower alkylanilino, aryloxy, alkoxy, thioalkoxy, thiophenoxy, mercapto, morpholino, pyrrolidino, piperidino, a group having the structure



where X is a covalent bond (9-carbazolyl group), oxygen (10 phenoxazinyl group) and sulfur (10-phenothiazinyl group), a 1-indolyl group having the structure



a 2-isoindolyl group having the structure



a 1-imidazolyl group having the structure

a 1-pyrroloyl group having the structure

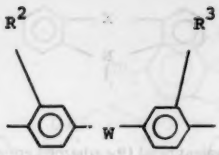
halo, hydroxyl, or carboxyl,

A is NH, O or S;

Z is the direct bond, O,S,SO_2, C, or CH_2;

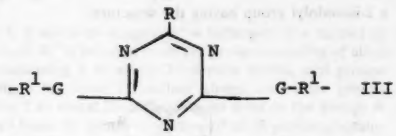
n is O or l;

R_1 is a divalent organic radical selected from alkylene groups containing from 2 to 12 carbon atoms; cycloalkylene groups containing from 4 to 6 carbon atoms; a xylylene group, arylene groups selected from ortho, meta or para phenylene, xylene, tolylene, biphenylene, naphthylene, or anthrylene; a substituted arylene group of the formula



II

wherein W is a covalent bond, sulfur, carbonyl, —NH, —N—(lower)alkyl, O, S, SS, —N-phenyl, sulfonyl, a linear or branched alkylene group of from 1 to 3 carbon atoms; arylene; or a dialkyl or diaryl silyl group; R^2 and R^3 are independent and each is hydrogen; halogen; lower alkyl from 1 to 5 carbon atoms; lower alkoxy containing from 1 to 5 carbon atoms; or aryl; or a group having the formula



III

wherein G is NH, O, S or the direct bond, and R and R^1 are as defined above; and

m is an integer of 2 or more.

3,957,727

EPOXY COMPOSITION CONTAINING ACID ANHYDRIDE COMPOUND OBTAINED FROM NADIC METHYL ANHYDRIDE

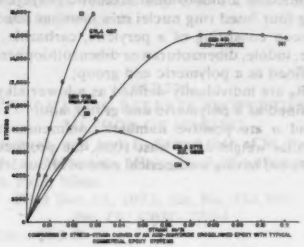
Paul Douglas McLean, and Robert Frederick Scott, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Dec. 18, 1973, Ser. No. 425,813

Int. Cl.² C08G *30/12*

U.S. Cl. 260—47 EA **9 Claims**

1. A heat curable composition of matter comprising (1) an epoxy resin selected from the group consisting of diglycidyl ether of bis-phenol A, epoxidized novolac resins and cyclic aliphatic epoxy resins and (2) as curing agent an acid-anhydride compound having an anhydride to acid ratio in the range of from 3-12:1 obtained by heating methyl endomethylene tetrahydrophthalic anhydride with the stoichiometric amount



of water required to produce the required anhydride-acid ratio.

3,957,728

POLYCARBONATES

Dieter Neuray, Rumeln-Kaldenhausen; Hugo Vernaleken, Krefeld, and Hans Rudolph, Krefeld-Bockum, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

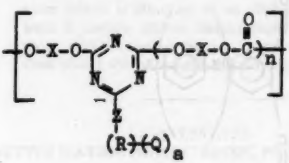
Continuation-in-part of Ser. No. 397,502, Sept. 14, 1973, Pat. No. 3,894,991. This application Sept. 16, 1974, Ser. No. 506,158

Claims priority, application Germany, Sept. 18, 1973, 2346935

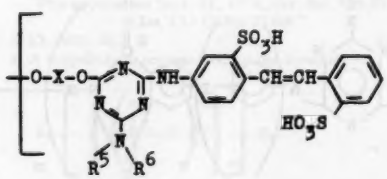
Int. Cl.² C08G *63/62;* **B01D** *15/08*

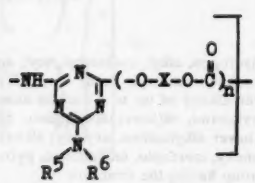
U.S. Cl. 260—47 XA **24 Claims**

1. A polycarbonate consisting essentially of structural units of the following formulae 3 and/or 4:



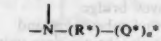
(3)



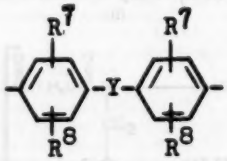


(4)

in which
Z represents -O-, -S-, -NH- or -NR¹- or

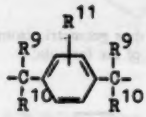


R and R* are identical or not identical and denote alkylene radicals with 1–20 carbon atoms, cycloalkylene radicals with 5–12 carbon atoms, mononuclear or polynuclear arylene radicals, or heteroarylene radicals bonded via carbon, with up to 14 carbon atoms, monosubstituted or polysubstituted mononuclear or polynuclear arylene radicals, or heteroarylene radicals bonded via carbon, with up to 14 ring carbon atoms and substituted with alkyl, alkoxy or alkylmercapto groups with 1–4 carbon atoms, halogen atoms, $-NO_2$ or -CN, alkylarylene radicals with a total of up to 30 carbon atoms or aralkylene radicals with a total of up to 30 carbon atoms,
R^1 denotes alkyl radicals with 1 to 20 carbon atoms, cycloalkyl radicals with 5 to 12 carbon atoms, mononuclear or polynuclear aryl radicals, or heteroaryl radicals bonded via carbon, with up to 14 ring carbon atoms, unsubstituted or substituted with alkyl, alkoxy or alkylmercapto groups with 1 to 4 carbon atoms, halogen atoms, $-NO_2$ or -CN, alkylaryl radicals with a total of up to 30 carbon atoms, aralkyl radicals with a total of up to 30 carbon atoms or hydroxyalkyl radicals with 1 to 10 carbon atoms,
Q and Q* are identical or not identical and denote a -COOH, $-COOR^2$, $-CONR^3R^4$, $-SO_3H$, $-SO_2NR^3R^4$ or aliphatic OH group,
R^2 represents alkyl groups with 1–4 carbon atoms,
R^3 and R^4 independently of one another represent hydrogen, straight-chain or branched alkyl groups with 1–4 carbon atoms or an unsubstituted, monosubstituted or polysubstituted phenyl radical or conjointly with the N atom form a 5-membered or 6-membered ring system and
a and a* are identical or not identical and denote an integer of from 1 to 4 inclusive,
R^5 and R^6 independently of one another represent H or alkyl, hydroxyalkyl, carboxyalkyl or alkoxycarbonyl-alkyl groups containing 1–5 carbon atoms, C_5-C_7- cycloalkyl groups or C_6-C_{14}- aryl groups or conjointly with the N atom form a 5-membered or 6-membered ring system,
X denotes an o-, m- or p-phenylene radical or an o-, m- or p-phenylene radical, monosubstituted or polysubstituted with alkyl groups having 1–4 carbon atoms or halogen atoms or denotes a radical characterized by the formula 5

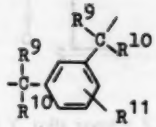


(5)

in which
R^7 and R^8 represent hydrogen atoms, alkyl radicals with 1–4 carbon atoms or halogen atoms and have identical or different meanings, and
Y denotes a single bond, an alkylene or alkylidene radical with 1–7 carbon atoms, a cycloalkylene or cycloalkylidene radical with 5 to 12 carbon atoms, -O-, -S-, -CO-, -SO-, $-SO_2$- or a radical of the formula 6*a* or 6*b*



(6a)



(6b)

wherein
R^9 to R^{11} denote alkyl radicals with 1–4 carbon atoms and R^{11} can also represent hydrogen or halogen atoms, and
n is an integer between 1 and 200.

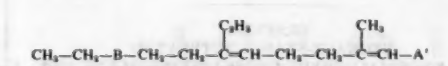
3,957,729

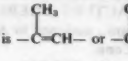
PROCESS FOR THE PREPARATION OF TRIDECADIEN DERIVATIVES

Frank Ratcliffe Atherton, Welwyn Garden City Herts, and Albert Pfiffner, Arlesheim, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 5, 1968, Ser. No. 781,603
Claims priority, application United Kingdom, Dec. 18, 1967, 57283/67
Int. Cl.² C07D *303/42*; C07C *102/00*, *67/00*
U.S. Cl. 260—348 A **5 Claims**

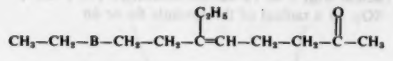
1. A process for producing an isomeric mixture containing a 2-cis, 6-trans-3,11-dimethyl-7-ethyl-trideca derivative of the formula:



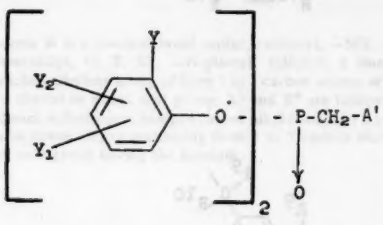
wherein B is  ;

A' is cyano, lower alkoxy carbonyl, amino carbonyl or lower alkyl substituted amino carbonyl

and its corresponding 2-trans, 6-trans geometric isomer comprising reacting a compound selected from the group consisting of a 5-trans, 9-cis-2-one of the formula:



wherein B is as above
its corresponding 5-trans, 9-trans geometric isomer and mixtures with a phosphine oxide of the formula:



wherein A' is as above, Z is lower alkyl, Y is hydrogen, halogen, lower alkoxy or lower dialkyl-amino and Y_1 and Y_2 are selected from the group consisting of hydrogen, halogen, lower alkoxy and nitro wherein said lower alkyl and lower alkoxy groups each have from 1 to 6 carbon atoms to form said isomeric mixture.

3,957,730

RECOVERY OF PURE 2-METHYL-2-HYDROXY-HEPTANONE-6

Roman Fischer, Mutterstadt; Hermann Overwien, Ludwigshafen, and Axel Nissen, Heidelberg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, (Rhine), Germany

Filed Sept. 16, 1974, Ser. No. 506,290
Claims priority, application Germany, Oct. 17, 1973, 2352054
Int. Cl.² C07C *45/24*
U.S. Cl. 260—594 **7 Claims**

1. A process for the recovery of pure 2-methyl-2-hydroxyheptanone-6 which comprises converting contaminated 2-methyl-2-hydroxyheptanone-6 into 2,2,6-trimethyl-2,3-hydroxy-4-H-pyran by treatment with 0.001 to 5% by weight, based on the starting mixture used, of an acid which is not volatile under the reaction conditions and is selected from the group consisting of sulfuric acid, phosphoric acid and an alkane dicarboxylic acid of up to six carbon atoms at a temperature of from 30° to 150°C, purifying the 2,2,6-trimethyl-2,3-hydro-4-H-pyran thus obtained by distillation, reacting the purified 2,2,6-trimethyl-2,3-hydro-4-H-pyran with water in the presence of an acid ion exchanger having sulfo or carboxylic acid ion exchange groups to convert said pyran into 2-methyl-2-hydroxyheptanone-6 and removing excess water by distillation from the aqueous solution of 2-methyl-2-hydroxyheptanone-6 thus obtained.

3,957,731

STORAGE-STABLE BUTYLATED UREA-FORMALDEHYDE CROSS-LINKING AGENT AND PROCESS FOR THE MANUFACTURE THEREOF

William Frederick Hart, Darien, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 25, 1975, Ser. No. 561,752
Int. Cl.² C08G *14/02*
U.S. Cl. 260—70 A **18 Claims**

1. A storage-stable substantially non-self-condensing toluene-soluble butylated urea-formaldehyde cross-linking agent of pumpable viscosity at 20°C. and substantially 100% resin solids content, having a weight average molecular weight of less than 1,000, consisting essentially of urea units carrying on the average 0.2 to 0.6 aldehyde-reactive hydrogen atoms per unit and between about:
0.6 to 1.0 formaldehyde bridge,
1.2 to 1.8 butoxymethyl substituent and
0 to 0.2 methylol substituent per urea unit therein.

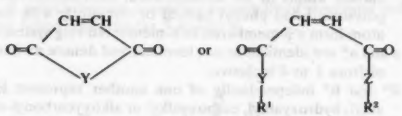
3,957,732

ALTERNATING COPOLYMERS HAVING FUNCTIONAL GROUP AND PROCESS FOR PRODUCING SAME

Masaaki Hirooka; Yoshikazu Fujii, both of Ibaragi; Kentaro Mashita, Takatsuki, and Fumiyuki Kimura, Settsu, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 29, 1974, Ser. No. 437,631
Claims priority, application Japan, Feb. 2, 1973, 48-13995
Int. Cl.² C08F *222/06, 222/24*
U.S. Cl. 526—90 **21 Claims**

1. An alternating copolymer having functional groups obtained by copolymerizing at least one olefin selected from the group consisting of isobutylene, propylene, butene-1, 2-methylbutene-1, 2-methyl-pentene-1, hexene-1, butene-2, 4-methylpentene-1, β-methallylchloride, 2-methyl-4-chloropentene-1, 2-methyl-4-phenylbutene-1 and octadecene-1, at least one acrylic ester and at least one α,β-ethylenically unsaturated dicarboxylic acid or its derivative represented by the formula:



wherein Y and Z are independently -O-, -S-, or -NR^3-; and R^1, R^2 and R^3 are independently hydrogen or hydrocarbon groups having 1 to 20 carbon atoms, said alternating copolymer consisting essentially of alternating sequences in which the olefin is bonded only to the acrylic ester or the α,β-ethylenically unsaturated dicarboxylic acid or its derivative, while the acrylic ester and the α,β-ethylenically unsaturated dicarboxylic acid or its derivative are bonded only to the olefin said alternating copolymer comprising about 50 mole percent olefin units, 0.1 to 49.9 mole percent acrylic ester units and 0.1 to 49.9 mole percent α,β-ethylenically unsaturated dicarboxylic acid or its derivative units and wherein the copolymer has an intrinsic viscosity of 0.1 to 10 dl/g as measured in toluene at 30°C.

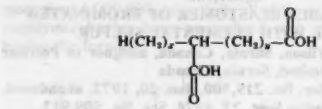
3,957,733

C_{10} DIACID TRIMETHYLHEXAMETHYLENE DIAMINE POLYAMIDES

Edgar R. Rogier, Hopkins; Allen H. Jevne, Anoka, and Gerald L. Schwebke, Minneapolis, all of Minn., assignors to Inc. General Mills Chemicals, Minneapolis, Minn.

Filed May 28, 1974, Ser. No. 473,866
Int. Cl.² C08G *69/26*
U.S. Cl. 260—78 R **2 Claims**

1. A polyamide resin consisting essentially of the amidification product of a mixture of isomers of heptadecane dicarboxylic acid having the formula:



wherein x is an integer from 1 to 15, y is an integer from 1 to 15 and the sum of x and y is 16, and trimethylhexamethylene diamine, wherein the equivalents of the dicarboxylic acid and the trimethylhexamethylene diamine are substantially equal, wherein the amidification reaction is conducted at a temperature between about 100°C. and 300°C., and wherein the amidification product has a logarithmic viscosity number of about 30 to 150 measured in orthochlorophenol at a concentration of 0.005 g./ml. and at a temperature of 30°C.

3,957,734

POLYAMIDE CONCENTRATES CONTAINING SULPHONATE GROUPS

Eduard Radlmann; Jürgen Schramm, and Günther Nischk, all of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

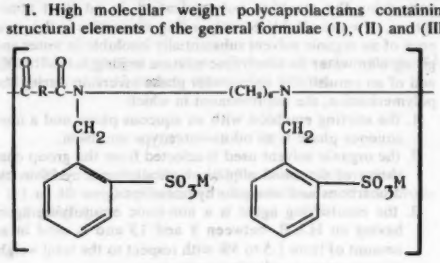
Filed Aug. 7, 1974, Ser. No. 495,427

Claims priority, application Germany, Aug. 7, 1973, 2339865

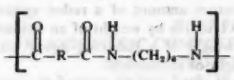
Int. Cl.² C08G 69/16, 69/26

U.S. Cl. 260—78 L **3 Claims**

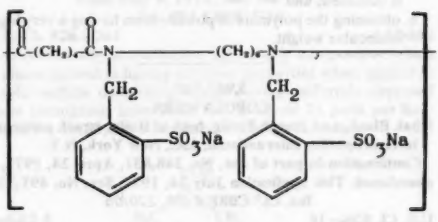
1. High molecular weight polycaprolactams containing structural elements of the general formulae (I), (II) and (III)



(I)



(II)

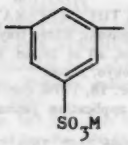


(III)

in which:

M is an alkali metal; and

R is an alkylene radical having from 4 to 12 carbon atoms or the radical,



where M is as defined above,

the polycaprolactams having relative solution viscosities of from 1.1 to 3.5 (as measured on solutions of 1 g of polyamide in 100 ml of m-cresol at 25°C) and containing sulphonate groups in a concentration range of from 40 to 2000 mval per kilogram of polymer.

3,957,735

FIBER-FORMING POLYHYDRAZIDES

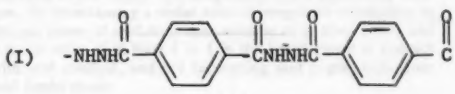
James S. Ridgway, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 506,376, Sept. 16, 1974, abandoned. This application Apr. 29, 1975, Ser. No. 572,787

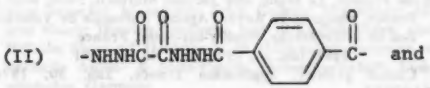
Int. Cl.² C08G 73/08

U.S. Cl. 260—78 TF **4 Claims**

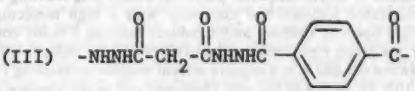
1. A fiber-forming polyhydrazide consisting essentially of recurring structural units of the formulas:



(I)



(II) and



(III)

wherein the mole ratio of units (I) to the sum of units (II) and (III) is from 1:9 to 9:1 and the mole ratio of units (III) to the sum of units (I) and (II) is from 3:97 to 15:85.

3,957,736

PROCESS FOR THE PREPARATION OF A RESIN

Shozo Tsuchiya, Kawasaki; Hideo Hayashi, and Hisatake Sato, both of Yokohama, all of Japan, assignors to Nippon Oil Company Ltd., Tokyo, Japan

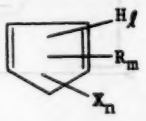
Filed Mar. 18, 1974, Ser. No. 452,255

Claims priority, application Japan, Mar. 26, 1973, 48-33455

Int. Cl.² C08F 2/02, 2/06, 220/06, 232/06

U.S. Cl. 526—11.1 13 Claims

1. A process for preparing a thermoplastic resin containing polar groups and unsaturated bonds which comprises reacting in the presence or absence of an inert solvent a three-component mixture consisting of (A) at least one compound selected from the group consisting of five-membered cyclic compounds containing unsaturated conjugate double bonds of the formula



wherein R is an organic residue of 1–24 carbon atoms, X is a halogen, and *l*, *m* and *n* are each an integer with the proviso that $l + m + n = 6$, and the Diels-Alder adducts of said five-membered cyclic compounds; (B) at least one compound selected from the group consisting of unsaturated carboxylic acids and the anhydrides thereof in an amount ranging from 0.01 to 0.5 mol per mol of (A), the number of mols of (A) being calculated on the basis of the five-membered ring of (A); and (C) at least one alcohol selected from the group consisting of the monohydric saturated and unsaturated alcohols in an amount ranging from 0.1 to 1.0 mol per equivalent of the carboxyl groups of (B), or in an amount ranging from 0.2 to 2.0 mols per equivalent of the acid anhydride groups when (B) is an acid anhydride.

3,957,737

METHOD FOR THE PREPARATION OF RUBBERS WITH LOW MOLECULAR WEIGHTS THROUGH DEGRADATION OF MACROMOLECULAR POLYENES, AND THE PRODUCTS THUS OBTAINED

Rene Pautrat, Le Mans, and Jacques Marteau, Paris, both of France, assignors to Anvar, Agence Nationale de Valorisation de la Recherche, Neuilly-sur-Seine, France

Filed Jan. 24, 1975, Ser. No. 543,781

Claims priority, application France, Jan. 30, 1974, 74.03052

Int. Cl.² C08C 19/08, 19/20

U.S. Cl. 260—79.3 R 18 Claims

1. A method of preparing low molecular weight rubbers with pasty to semi-liquid or liquid consistencies through degradation of macromolecular polyenes, comprising reacting an unsaturated hydrocarbon elastomer with a high molecular weight upon an oxidizer and a reducer forming a redox couple, the molar ratio between the oxidizer and the reducer lying between 0.5 and 6, in a organic solvent medium containing 1% to 10% by weight of the said elastomer and in the absence of air, or in an aqueous medium containing 10% to 60% by weight of the said elastomer, the oxidizer being selected from the group consisting of hydrogen peroxide and organic peroxides, and the reducer being selected from the group consisting of sulphinic acids and their derivatives and of hydrazine and its derivatives, at a temperature lying between room temperature and 250°C, the proportion of the reducer being of 100 millimoles to 1 millimole per 100 g of said elastomer.

3,957,738

VULCANIZABLE ELASTOMER OF BROMINATED BUTYL WITH ELEMENTAL SULFUR

Geoffrey John Wilson, Sarnia, Canada, assignor to Polymer Corporation Limited, Sarnia, Canada

Continuation of Ser. No. 219,500, Jan. 20, 1972, abandoned. This application Sept. 27, 1974, Ser. No. 509,912

Claims priority, application Canada, Feb. 11, 1971, 105073

Int. Cl.² C08D 3/14, 9/00

U.S. Cl. 260—79.5 C 5 Claims

1. A process for vulcanizing brominated butyl rubber, wherein the butyl rubber is a copolymer of isobutylene and isoprene in which the copolymerized isoprene forms from 0.5 to 3.0 mole percent of the copolymer and which has been brominated with up to three atoms of bromine per carbon-to-carbon double bond, comprising the steps of mixing said brominated butyl rubber with a vulcanization system consisting of 0.1 to 5 parts of elemental sulphur as the sole vulcanizing agent per 100 parts by weight of said rubber, and heating the mixture to vulcanize it.

3,957,739

PROCESS OF PRODUCTION OF WATER-SOLUBLE LINEAR POLYMERS OF VERY HIGH MOLECULAR WEIGHT

Jean Cabestany, Seine-Saint-Denis, and Erich Schaffer, Oise, both of France, assignors to Nobel Hoechst Chimie, Puteaux, France

Filed Nov. 27, 1974, Ser. No. 527,764

Int. Cl.² C08F 20/06, 20/56

U.S. Cl. 526—207 7 Claims

1. In a process for preparing linar acrylic and methacrylic polymers and copolymers in powder form soluble in water comprising the emulsion polymerization, in an inert atmosphere, of water soluble corresponding monomers in the presence of an organic solvent substantially insoluble in water and giving with water an azeotropic mixture boiling below 100°C, and of an emulsifying agent, with phase inversion during the polymerization, the improvement in which

1. the starting emulsion with an aqueous phase and a non-aqueous phase is an oil-in-water type emulsion,
2. the organic solvent used is selected from the group consisting of saturated aliphaic hydrocarbons, cyclanic hydrocarbons and aromatic hydrocarbons,
3. the emulsifying agent is a non-ionic emulsifying agent having an H.L.B. between 8 and 13 and is used in an amount of from 1.5 to 5% with respect to the total weight of monomers + solvents,
4. the polymerization is initiated at a temperature below 35°C by adding a minimum amount of a redox system initiator consisting of 0.1 to 1% by weight of an oxidant and 0.05 to 0.5% by weight of a reducing agent with respect to the total weight of monomers
5. said polymerization is carried out in a closed vessel, without cooling until the maximum reaction temperature is obtained, and
6. obtaining the polymers in powder form having a very high molecular weight.

3,957,740

COPOLYMERS

Izhak Blank, and Joseph Fertig, both of Haifa, Israel, assignors to Hydrophilics International, Inc., New York, N.Y.

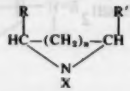
Continuation-in-part of Ser. No. 246,831, April 24, 1972, abandoned. This application July 24, 1974, Ser. No. 491,535

Int. Cl.² C08F 8/30, 220/06

U.S. Cl. 526—16 5 Claims

1. A copolymer comprising from 10 to 30 parts, by volume, of a member selected from the class consisting of acrylic and methacrylic acid and from 50 to 90 parts by volume of a member selected from the class consisting of lower alkyl acrylate and methacrylate, said copolymer having been formed by bulk copolymerization to a molecular weight of

more than 1,000,000, essentially all of the acids groups of said copolymer having been neutralized with an alkylene imine having the formula:



where R and R′ are each selected from the class consisting of hydrogen and lower alkyl radicals, X is hydrogen or hydroxyl, and *n* is a number from 0 to 4.

3,957,741

CROSSLINKED, POROUS, POLYACRYLATE BEADS

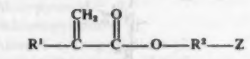
Alan Rembaum; Shiao-Ping Siao Yen, and William J. Dreyer, all of Altadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jan. 17, 1974, Ser. No. 434,124

Int. Cl.² C08F *226/00*, *218/00*

U.S. Cl. 526—312 **8 Claims**

1. A composition consisting essentially of uniformly shaped, hydrophilic, swellable, porous, round beads, at least 80% having a uniform diameter from less than to 2 microns and being the cross-linked polymer of an acrylic monomer containing an hydroxy or amino group and of the formula:



where R^1 is hydrogen or lower alkyl of 1–8 carbon atoms, R^2 is alkylene of 1–12 carbon atoms, Z is OH or

where R^3 or R^4 are H, lower alkyl or lower alkoxy, and 0.1 to 30 weight percent of a liquid diene or triene cross-linking agent.

3,957,742

ELASTOMERIC COMPOSITIONS CONTAINING HEXAHYDRO-S-TRIAZINES

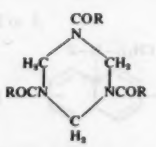
James A. Kveton, Orland Park, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed May 9, 1975, Ser. No. 575,882

Int. Cl.² C08K *5/34*

U.S. Cl. 526—261 **4 Claims**

1. A normally non-adhesive elastomeric composition which is characterized as having adhesive properties when applied to a solid surface comprising rubber having uniformly dispersed there throughout from about 0.1 to about 25 parts per hundred of a hexahydro-s-triazine having the formula



where R is an aliphatic hydrocarbon radical of not more than 10 carbon atoms containing at least 1 olefinic group.

3,957,743

PROCESS FOR PRODUCING ELASTOMERS AND INTERMEDIATES FOR SYNTHETIC RUBBERS

Giulio Natta; Giorgio Mazzanti, both of Milan, Italy, and Giorgio Boschi, Brussels, Belgium, assignors to Montecatini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 161,281, July 9, 1971, abandoned, which is a continuation of Ser. No. 626,367, March 22, 1967, abandoned, which is a continuation-in-part of Ser. No. 514,764, Nov. 8, 1965, abandoned, which is a continuation-in-part of Ser. No. 147,970, Oct. 26, 1961, abandoned, and a continuation-in-part of Ser. No. 629,085, Dec. 18, 1956, abandoned. This application Feb. 28, 1974, Ser. No. 446,920

The portion of the term of this patent subsequent to Jan. 24, 1984, has been disclaimed.

Int. Cl.² C08F *210/00*, *212/00*

U.S. Cl. 526—154 **15 Claims**

1. A process of preparing amorphous, elastomeric, linear copolymers of ethylene and propylene containing from 20% to about 70% by weight of ethylene in the macromolecule, characterized in that the infra-red spectra thereof show, in the 13 to 14 micron region, absorptions at 13.6 microns and at 13.85 microns, and show, in the 10 to 11 micron region, absorptions at 10.67 microns and at 10.3 microns, and further characterized in being substantially free of homopolymers, and in having a molecular weight above 20,000, as determined by viscosity measurements in tetralin at 135°C. and calculated by the formula

$$[\eta] = 1.18 \times 10^{-3} \times M^{0.65},$$

in which $[\eta]$ represents intrinsic viscosity and M represents molecular weight, which process comprises (a) contacting a mixture of monomers to be polymerized with a liquid phase catalyst essentially free of microcrystalline precipitates, said catalyst being prepared by mixing an alkyl aluminum compound in which the alkyl groups contain from 2 to 6 carbon atoms with a hydrocarbon-soluble vanadium compound, at least one of the catalyst-forming components containing halogen, (b) maintaining a molar ratio of propylene to ethylene in the gas phase of said monomer mixture of at least 1 to 1 and a molar ratio of at least 4 to 1 in the liquid phase in contact with said catalyst, and (c) recovering said copolymers from said liquid phase.

3,957,744

POLYMERIZATION OF VINYL CHLORIDE IN AQUEOUS SUSPENSION

Walter Deuschel, Mannheim; Erich Gulbins, Heidelberg; Alfred Hauss; Dietrich Lausberg, both of Ludwigshafen, and Wilhelm Sigmund, Heidelberg, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 15, 1973, Ser. No. 341,452

Claims priority, application Germany, Mar. 17, 1972, 2212962

Int. Cl.² C08F *1/60*, *1/78*, *3/30*, *15/28*

U.S. Cl. 526—73 **8 Claims**

1. A process for the polymerization of vinyl chloride or vinyl chloride and up to 30% by weight of conventional comonomers in aqueous suspension in the presence of a free-radical initiator and a water-soluble protective colloid in a stirred reactor, wherein the polymerization mixture is heated to the desired polymerization temperature in a heat-up phase which constitutes not more than one third of the time required for the full polymerization cycle, whereupon polymerization is carried out in the polymerization phase at a substantially constant temperature, which process comprises

a. using at least one free-radical initiator having a half-life at 50°C of less than 10 hours,

b. maintaining the polymerization mixture at a pH of less than 8 during the heat-up phase, and

3,957,736

PROCESS FOR THE PREPARATION OF A RESIN

Shozo Tsuchiya, Kawasaki; Hideo Hayashi, and Hisatake Sato, both of Yokohama, all of Japan, assignors to Nippon Oil Company Ltd., Tokyo, Japan

Filed Mar. 18, 1974, Ser. No. 452,255
Claims priority, application Japan, Mar. 26, 1973, 48-33455
Int. Cl.² C08F 2/02, 2/06, 220/06, 232/06
U.S. Cl. 526—11.1 13 Claims

1. A process for preparing a thermoplastic resin containing polar groups and unsaturated bonds which comprises reacting in the presence or absence of an inert solvent a three-component mixture consisting of (A) at least one compound selected from the group consisting of five-membered cyclic compounds containing unsaturated conjugate double bonds of the formula

wherein R is an organic residue of 1–24 carbon atoms, X is a halogen, and *l*, *m* and *n* are each an integer with the proviso that $l + m + n = 6$, and the Diels-Alder adducts of said five-membered cyclic compounds; (B) at least one compound selected from the group consisting of unsaturated carboxylic acids and the anhydrides thereof in an amount ranging from 0.01 to 0.5 mol per mol of (A), the number of mols of (A) being calculated on the basis of the five-membered ring of (A); and (C) at least one alcohol selected from the group consisting of the monohydric saturated and unsaturated alcohols in an amount ranging from 0.1 to 1.0 mol per equivalent of the carboxyl groups of (B), or in an amount ranging from 0.2 to 2.0 mols per equivalent of the acid anhydride groups when (B) is an acid anhydride.

3,957,737

METHOD FOR THE PREPARATION OF RUBBERS WITH LOW MOLECULAR WEIGHTS THROUGH DEGRADATION OF MACROMOLECULAR POLYENES, AND THE PRODUCTS THUS OBTAINED

Rene Pautrat, Le Mans, and Jacques Marteau, Paris, both of France, assignors to Anvar, Agence Nationale de Valorisation de la Recherche, Neuilly-sur-Seine, France

Filed Jan. 24, 1975, Ser. No. 543,781
Claims priority, application France, Jan. 30, 1974, 74.03052
Int. Cl.² C08C 19/08, 19/20
U.S. Cl. 260—79.3 R 18 Claims

1. A method of preparing low molecular weight rubbers with pasty to semi-liquid or liquid consistencies through degradation of macromolecular polyenes, comprising reacting an unsaturated hydrocarbon elastomer with a high molecular weight upon an oxidizer and a reducer forming a redox couple, the molar ratio between the oxidizer and the reducer lying between 0.5 and 6, in a organic solvent medium containing 1% to 10% by weight of the said elastomer and in the absence of air, or in an aqueous medium containing 10% to 60% by weight of the said elastomer, the oxidizer being selected from the group consisting of hydrogen peroxide and organic peroxides, and the reducer being selected from the group consisting of sulphinic acids and their derivatives and of hydrazine and its derivatives, at a temperature lying between room temperature and 250°C, the proportion of the reducer being of 100 millimoles to 1 millimole per 100 g of said elastomer.

3,957,738

VULCANIZABLE ELASTOMER OF BROMINATED BUTYL WITH ELEMENTAL SULFUR

Geoffrey John Wilson, Sarnia, Canada, assignor to Polymer Corporation Limited, Sarnia, Canada

Continuation of Ser. No. 219,500, Jan. 20, 1972, abandoned. This application Sept. 27, 1974, Ser. No. 509,912
Claims priority, application Canada, Feb. 11, 1971, 105073
Int. Cl.² C08D 3/14, 9/00
U.S. Cl. 260—79.5 C 5 Claims

1. A process for vulcanizing brominated butyl rubber, wherein the butyl rubber is a copolymer of isobutylene and isoprene in which the copolymerized isoprene forms from 0.5 to 3.0 mole percent of the copolymer and which has been brominated with up to three atoms of bromine per carbon-to-carbon double bond, comprising the steps of mixing said brominated butyl rubber with a vulcanization system consisting of 0.1 to 5 parts of elemental sulphur as the sole vulcanizing agent per 100 parts by weight of said rubber, and heating the mixture to vulcanize it.

3,957,739

PROCESS OF PRODUCTION OF WATER-SOLUBLE LINEAR POLYMERS OF VERY HIGH MOLECULAR WEIGHT

Jean Cabestany, Seine-Saint-Denis, and Erich Schaffer, Oise, both of France, assignors to Nobel Hoechst Chimie, Puteaux, France

Filed Nov. 27, 1974, Ser. No. 527,764
Int. Cl.² C08F 20/06, 20/56
U.S. Cl. 526—207 7 Claims

1. In a process for preparing linar acrylic and methacrylic polymers and copolymers in powder form soluble in water comprising the emulsion polymerization, in an inert atmosphere, of water soluble corresponding monomers in the presence of an organic solvent substantially insoluble in water and giving with water an azeotropic mixture boiling below 100°C, and of an emulsifying agent, with phase inversion during the polymerization, the improvement in which

1. the starting emulsion with an aqueous phase and a non-aqueous phase is an oil-in-water type emulsion,
2. the organic solvent used is selected from the group consisting of saturated aliphaic hydrocarbons, cyclanic hydrocarbons and aromatic hydrocarbons,
3. the emulsifying agent is a non-ionic emulsifying agent having an H.L.B. between 8 and 13 and is used in an amount of from 1.5 to 5% with respect to the total weight of monomers + solvents,
4. the polymerization is initiated at a temperature below 35°C by adding a minimum amount of a redox system initiator consisting of 0.1 to 1% by weight of an oxidant and 0.05 to 0.5% by weight of a reducing agent with respect to the total weight of monomers
5. said polymerization is carried out in a closed vessel, without cooling until the maximum reaction temperature is obtained, and
6. obtaining the polymers in powder form having a very high molecular weight.

3,957,740

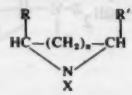
COPOLYMERS

Izhak Blank, and Joseph Fertig, both of Haifa, Israel, assignors to Hydrophilics International, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 246,831, April 24, 1972, abandoned. This application July 24, 1974, Ser. No. 491,535
Int. Cl.² C08F 8/30, 220/06
U.S. Cl. 526—16 5 Claims

1. A copolymer comprising from 10 to 30 parts, by volume, of a member selected from the class consisting of acrylic and methacrylic acid and from 50 to 90 parts by volume of a member selected from the class consisting of lower alkyl acrylate and methacrylate, said copolymer having been formed by bulk copolymerization to a molecular weight of

more than 1,000,000, essentially all of the acids groups of said copolymer having been neutralized with an alkylene imine having the formula:



where R and R′ are each selected from the class consisting of hydrogen and lower alkyl radicals, X is hydrogen or hydroxyl, and *n* is a number from 0 to 4.

3,957,741

CROSSLINKED, POROUS, POLYACRYLATE BEADS

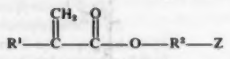
Alan Rembaum; Shiao-Ping Siao Yen, and William J. Dreyer, all of Altadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jan. 17, 1974, Ser. No. 434,124

Int. Cl.² C08F *226/00, 218/00*

U.S. Cl. 526—312 **8 Claims**

1. A composition consisting essentially of uniformly shaped, hydrophilic, swellable, porous, round beads, at least 80% having a uniform diameter from less than to 2 microns and being the cross-linked polymer of an acrylic monomer containing an hydroxy or amino group and of the formula:



where R^1 is hydrogen or lower alkyl of 1–8 carbon atoms, R^2 is alkylene of 1–12 carbon atoms, Z is OH or

where R^3 or R^4 are H, lower alkyl or lower alkoxy, and

0.1 to 30 weight percent of a liquid diene or triene cross-linking agent.

3,957,742

ELASTOMERIC COMPOSITIONS CONTAINING HEXAHYDRO-S-TRIAZINES

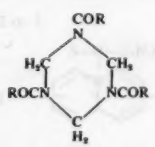
James A. Kveton, Orland Park, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed May 9, 1975, Ser. No. 575,882

Int. Cl.² C08K *5/34*

U.S. Cl. 526—261 **4 Claims**

1. A normally non-adhesive elastomeric composition which is characterized as having adhesive properties when applied to a solid surface comprising rubber having uniformly dispersed there throughout from about 0.1 to about 25 parts per hundred of a hexahydro-s-triazine having the formula



where R is an aliphatic hydrocarbon radical of not more than 10 carbon atoms containing at least 1 olefinic group.

3,957,743

PROCESS FOR PRODUCING ELASTOMERS AND INTERMEDIATES FOR SYNTHETIC RUBBERS

Giulio Natta; Giorgio Mazzanti, both of Milan, Italy, and Giorgio Boschi, Brussels, Belgium, assignors to Montecatini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 161,281, July 9, 1971, abandoned, which is a continuation of Ser. No. 626,367, March 22, 1967, abandoned, which is a continuation-in-part of Ser. No. 514,764, Nov. 8, 1965, abandoned, which is a continuation-in-part of Ser. No. 147,970, Oct. 26, 1961, abandoned, and a continuation-in-part of Ser. No. 629,085, Dec. 18, 1956, abandoned. This application Feb. 28, 1974, Ser. No. 446,920

The portion of the term of this patent subsequent to Jan. 24, 1984, has been disclaimed.

Int. Cl.² C08F *210/00, 212/00*

U.S. Cl. 526—154 **15 Claims**

1. A process of preparing amorphous, elastomeric, linear copolymers of ethylene and propylene containing from 20% to about 70% by weight of ethylene in the macromolecule, characterized in that the infra-red spectra thereof show, in the 13 to 14 micron region, absorptions at 13.6 microns and at 13.85 microns, and show, in the 10 to 11 micron region, absorptions at 10.67 microns and at 10.3 microns, and further characterized in being substantially free of homopolymers, and in having a molecular weight above 20,000, as determined by viscosity measurements in tetralin at 135°C. and calculated by the formula

$$[\eta] = 1.18 \times 10^{-3} \times M^{0.68},$$

in which $[\eta]$ represents intrinsic viscosity and M represents molecular weight, which process comprises (a) contacting a mixture of monomers to be polymerized with a liquid phase catalyst essentially free of microcrystalline precipitates, said catalyst being prepared by mixing an alkyl aluminum compound in which the alkyl groups contain from 2 to 6 carbon atoms with a hydrocarbon-soluble vanadium compound, at least one of the catalyst-forming components containing halogen, (b) maintaining a molar ratio of propylene to ethylene in the gas phase of said monomer mixture of at least 1 to 1 and a molar ratio of at least 4 to 1 in the liquid phase in contact with said catalyst, and (c) recovering said copolymers from said liquid phase.

3,957,744

POLYMERIZATION OF VINYL CHLORIDE IN AQUEOUS SUSPENSION

Walter Deuschel, Mannheim; Erich Gulbins, Heidelberg; Alfred Hauss; Dietrich Lausberg, both of Ludwigshafen, and Wilhelm Sigmund, Heidelberg, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 15, 1973, Ser. No. 341,452

Claims priority, application Germany, Mar. 17, 1972, 2212962

Int. Cl.² C08F *1/60, 1/78, 3/30, 15/28*

U.S. Cl. 526—73 **8 Claims**

1. A process for the polymerization of vinyl chloride or vinyl chloride and up to 30% by weight of conventional comonomers in aqueous suspension in the presence of a free-radical initiator and a water-soluble protective colloid in a stirred reactor, wherein the polymerization mixture is heated to the desired polymerization temperature in a heat-up phase which constitutes not more than one third of the time required for the full polymerization cycle, whereupon polymerization is carried out in the polymerization phase at a substantially constant temperature, which process comprises

a. using at least one free-radical initiator having a half-life at 50°C of less than 10 hours,

b. maintaining the polymerization mixture at a pH of less than 8 during the heat-up phase, and

c. maintaining the temperature of the reactor walls above, by not more than 20°C, the temperature of the polymerization mixture during the heat-up phase and maintaining the temperature of the reactor walls below that of the polymerization mixture during the polymerization phase.

3,957,745

FLAVORING AND FRAGRANCE COMPOSITIONS

Fernand Marcel Cassan, Grasse, France, assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed July 25, 1974, Ser. No. 491,702

Int. Cl.² C07G *17/00*

U.S. Cl. 260—125 **9 Claims**

1. A flavor modifying composition comprising the reaction product of a sulfur-containing compound selected from the group consisting of sodium sulfhydrate, cystein, butyl mercaptan and ammonium sulfide with a carbonyl compound selected from the group consisting of butyroin, 1,3-dihydroxy-2-propanone, 3-hydroxy-3-methyl-2-butanone, 4-methyl-3,4-epoxy-2-pentanone and 2,3-epoxyheptaldehyde (2,3-epoxy-1-heptanal).

3,957,746

PHOSPHO-SULFURIZED PHENOLIC ALDEHYDE AMINE ALKYLENE OXIDE CONDENSATION PRODUCT

Robert E. Malec, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 4, 1974, Ser. No. 512,363

Int. Cl.² C09B *49/00*

U.S. Cl. 260—125 **27 Claims**

1. An additive having dispersancy and antiwear properties in lubricating oils, said additive being made by the process comprising:

A. reacting 1 mole part of an poly-C_{2-4} olefin substituted phenol wherein said polyolefin substituent has an average molecular weight of from about 650 to 5000 with from about 1–10 mole parts of a C_{1-4} aldehyde and from about 0.1–10 mole parts of a nitrogen compound, said nitrogen compound being selected from the group consisting of ammonia and amines containing at least one HN< group and containing from 1 to about 20 carbon atoms at reaction temperatures to form a Mannich condensation product,

B. reacting said condensation product with about 0.1–5.0 mole parts of an alkylene oxide containing from 2 to about 6 carbon atoms to form an akoxylated product, and

C. reacting said alkoxylated product with about 0.05 to 1 mole part of P_2S_5 at reaction temperature to form said additive.

3,957,747

6-HYDROXYPYRID-2-ONE AZO DYESTUFFS

Peter William Austin, and David Shaw Leitch, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

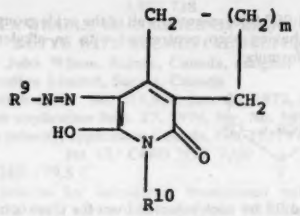
Continuation-in-part of Ser. No. 238,620, March 27, 1972, abandoned. This application Nov. 18, 1974, Ser. No. 524,869

Claims priority, application United Kingdom, May 18, 1971, 15474/71

Int. Cl.² C09B *62/08, 62/16, 62/24, 62/50*

U.S. Cl. 260—153 **5 Claims**

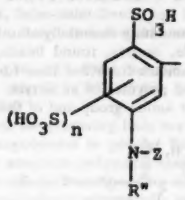
1. A dyestuff of the formula



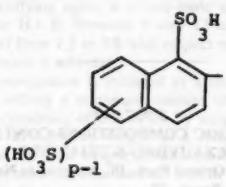
wherein

m is 1, 2 or 3;

R^9 is selected from the group consisting of

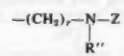


wherein *n* is 0 or 1 and R'' is hydrogen or lower alkyl and

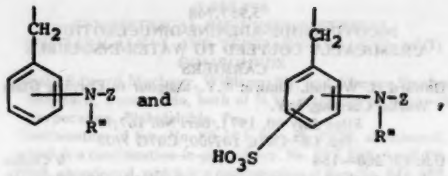


wherein *p* is 1, 2 or 3;

R^{10} is selected from the group consisting of C_{1-6} alkyl, benzyl, sulphobenzyl, phenylethyl, sulphophenylethyl,



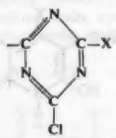
wherein *r* is 2 to 6,



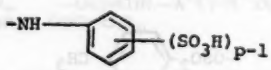
wherein R'' has the meaning given above and the dyestuff as a whole contains only one group represented by Z; and

Z is a cellulose-reactive group selected from the group consisting of

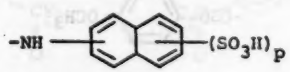
2,3-dichloroquinoxalin-5-sulphonyl,
2,3-dichloroquinoxalin-5-carbonyl,
2,3-dichloroquinoxalin-6-sulphonyl,
2,3-dichloroquinoxalin-6-carbonyl,
2,4-dichloroquinazolin-6-sulphonyl,
2,4-dichloroquinazolin-6-carbonyl,
2,4-dichloroquinazolin-7-sulphonyl,
2,4,6-trichloroquinazolin-7-sulphonyl,
2,4,6-trichloroquinazolin-8-sulphonyl,
2,4,7-trichloroquinazolin-6-sulphonyl,
2,4,8-trichloroquinazolin-6-sulphonyl,
1,4-dichlorophthalazin-6-carbonyl,
β(4,5-dichloropyridazon-1-yl) propionyl,
2,4-dichloropyrimidin-5-carbonyl,
4-(4',5'-dichloropyridazon-1-yl) phenylsulphonyl,
2,4-dichloropyrimid-6-yl,
2,4,5-trichloropyrimid-6-yl,
2,4-dichloro-5-cyanopyrimid-6-yl,
2,4-difluoro-5-chloropyrimid-6-yl,
5-chloro-6-methyl-2-methylsulphonylpyrimid-4-yl,
2,4-dichloro-5-bromopyrimid-6-yl,
2,4-dichloropyrimidin-5-sulphonyl,
2,2,3,3-tetrafluorocyclobutylcarbonyl,
2,3,3-trifluorocyclobut-1-enyl carbonyl,
β-(2,2,3,3-tetrafluorocyclobutyl) acryloyl,
β-(2,3,3-trifluorocyclobut-1-enyl) acryloyl,
2-chlorobenzthiazol-6-carbonyl,



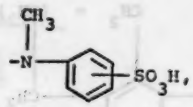
wherein X is Cl, NH_2, lower alkoxy, phenoxy, sulphophenoxy, lower alkylamino, di(lower alkyl)amino,

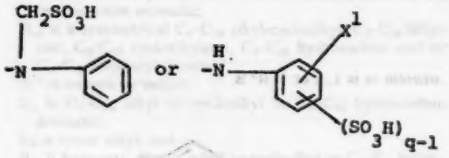


wherein p is 1, 2 or 3,

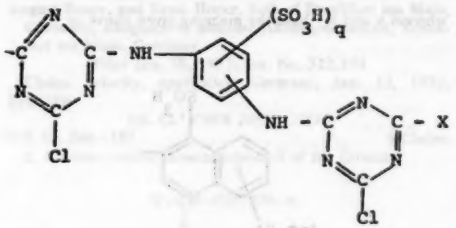


wherein p is 1, 2 or 3,

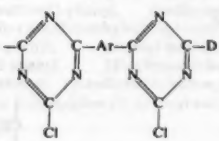




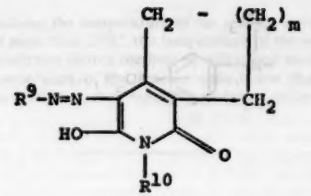
wherein X^1 is CH_3, Cl, OCH_3 or CO_2H and q is 1 or 2,



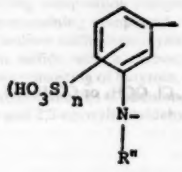
wherein q and X have the meanings given above, and



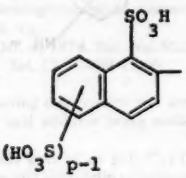
wherein Ar is the N,N'-divalent radical of a diamine selected from the group consisting of 4,4'-diaminodiphenylether, 4,4'-diamino diphenylsulphone, 4,4'-diaminodiphenoxyethane-2,2'-disulphonic acid, 2,6-naphthalene-4,8-disulphonic acid, benzidine-2,2'-disulphonic acid, 4,4'-diamino-diphenylurea-2,2'-disulphonic acid, 4,4'-diamino-stilbene-2,2'-disulphonic acid, 1,3-diaminobenzene-4,6-disulphonic acid and 4,4'-diaminodiphenylsulphide-2,2'-disulphonic acid, and D is a second monovalent monoazo entity of the formula



wherein *m* is 1, 2 or 3; R^9 is

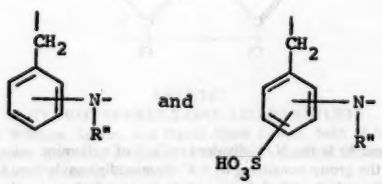


wherein *n* and R'' have the meaning given above or



wherein p has the meaning given above; and R_{10} is selected from the group consisting of C_{1-6} alkyl, benzyl, sulphobenzyl, phenylethyl, sulphophenylethyl,

where *r* is 2 to 6,



wherein R'' has the meaning given above.

3,957,748

NICOTINAMIDE-ADENINE-DINUCLEOTIDE CHEMICALLY COUPLED TO WATER-INSOLUBLE CARRIERS

Howard H. Weetall, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed July 30, 1971, Ser. No. 167,770
Int. Cl.[2] C07C *107/00*; C07G *7/02*
U.S. Cl. 260—154 6 Claims

1. A method of preparing a composite consisting of nicotinamide-adenine-dinucleotide coupled chemically to a carrier material in such a manner that the nicotinamide-adenine-dinucleotide does not lose its redox properties which comprises the steps of diazotizing a carrier material selected from the group consisting of glass particles having a diazotizable silane coupling agent attached thereto, p-aminobenzylcellulose, polyaminopolystyrene, and the half amide of benzidine-carboxymethylcellulose to form a diazo salt intermediate, and immediately thereafter reacting the diazotized carrier material with an aqueous solution of nicotinamide-adenine-dinucleotide.

6. A composite consisting of nicotinamide-adenine-dinucleotide coupled chemically to a carrier material in accordance with the method of claim 1.

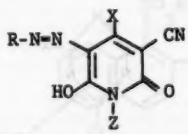
3,957,749

WATER-INSOLUBLE MONOAZO PYRIDINE DYES

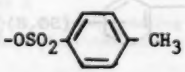
Hanswilli von Brachel, Offenbach (Main); Ernst Heinrich, Frankfurt am Main-Fechenheim; Otto Gräwinger, Frankfurt am Main-Fechenheim; Karl Hintermeier, Frankfurt am Main-Fechenheim, and Horst Kindler, Frankfurt am Main-Fechenheim, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

Continuation of Ser. No. 882,285, Dec. 4, 1969, abandoned.
This application June 5, 1972, Ser. No. 259,781
Claims priority, application Germany, Dec. 7, 1968, 1813385
Int. Cl.[2] C09B *29/36*; D06P *3/24*, *3/40*, *3/52*
U.S. Cl. 260—156 4 Claims

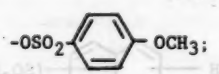
1. A monoazo dye of the formula



wherein R is monosubstituted phenyl whose substituent is selected from the group consisting of $-OSO_2CH_3$, $-OSO_2$-phenyl, $-OSO_2C_2H_5$, $-OSO_2C_2H_4Cl$, $-OSO_2C_4H_9$, $-OSO_2C_6H_{13}$,



and



X is alkyl having from 1 to 6 carbon atoms and Z is alkyl having from 1 to 6 carbon atoms or methoxyalkyl or hydroxyalkyl having from 1 to 6 carbon atoms in each alkyl moiety.

3,957,750
SYMMETRICAL BIS(UNSYMMETRICAL TERTIARY-ALKYL AND TERTIARY-ARALKYL AZO) COMPOUNDS

Ronald Edward MacLeay, Williamsville, and Chester Stephen Sheppard, Tonawanda, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 88,247, Nov. 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 725,180, April 29, 1968, abandoned, which is a continuation of Ser. No. 616,158, Feb. 15, 1967, abandoned. This application Dec. 26, 1973, Ser. No. 428,493

Int. Cl.² C07C *107/02*

U.S. Cl. 260—174 **6 Claims**

1. Symmetrical bis(unsymmetrical t-alkyl or t-aralkyl azo) compounds

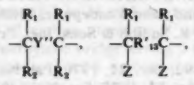
$$R{-}N{=}N{-}R_{12}{-}N{=}N{-}R'$$

where:

R equals R′ equals $(R'')_3C$;

$(R'')_3C$ is C_6–C_{20} t-alkyl, cycloalkyl, alkylcycloalkyl, arylcycloalkyl or aralkyl where R″ is C_1–C_8 alkyl, C_7–C_{12} aralkyl C_6–C_{14} aryl, not more than one R″ being aromatic, and 2 or 3 of said R″s can join with the tertiary carbon atom to form a cyclo-, bicyclo- or tricyclo-hydrocarbon radical of 3–12 carbons.

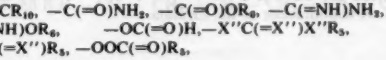
R_{12} is



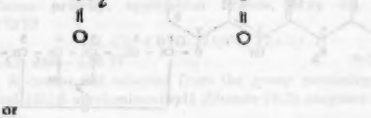
or

R_1 and R_2 are C_1-C_8 alkyl, C_5-C_{12}cyclo-, bicyclo- or tricycloalkyl, C_7–C_{12} aralkyl, or 5-6 membered heterocyclic wherein the hereto atom is O or N, R_1 and R_2 taken together can form a C_3–C_{11} alkylene diradical, one or more of each of the R_1s and R_2s can be substituted with lower alkoxy, hydroxy, carboxy, lower alkoxycarbonyl, lower alkylcarbonyloxy, halo, cyano, dimethylamido or lower alkylsulfonato radicals, and R_1 can also be C_6–C_{14}aryl;

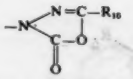
Y″ is —NHNH—, —S—, —O—, —SS—,



Z is —CN, —Cl, —Br, —X″R_5, —N_3, —SCN, —NCS, —OCN —OOR, —OOH, —OH, —R_5, —NO_2, —NO_3, —C_6 CR_{10}, —C(=O)NH_2, —C(=O)OR_6, —C(=NH)NH_2, —C(=NH)OR_6, —OC(=O)H,—X″C(=X″)X″R_5, —X″C(=X″)R_5, —OOC(=O)R_5,



or



R'_{13} is a C_2-C_{20} symmetrical diradical selected from alkyl, alkylaralkyl or alkylcycloalkylalkyl groups optionally containng two or more non-adjacent oxygen, sulfur or nitrogen atoms in the backbone structure, cycloalkyl or, when R_1 is not phenyl or substituted phenyl, from C_6–C_{12} hydrocarbon aromatic;

R_{13} is a symmetrical C_5–C_{15} alkyl-cycloalkyl, C_5–C_{10} alkylene, C_3–C_{12} cycloalkylene, C_6–C_{12} hydrocarbon aryl or C_5–C_{15} alkyl-aryl diradical;

X″ is oxygen or sulfur;

R_5 is C_1–C_{10} alkyl or cycloalkyl or C_6–C_{12} hydrocarbon aromatic;

R_6 is lower alkyl; and

R_{10} is hydrogen, C_1–C_{10} alkyl or cycloalkyl or C_6–C_{12} hydrocarbon aryl.

3,957,751
WATER-SOLUBLE REACTIVE DYESTUFFS OF THE MONOAZO SERIES CONTAINING AN ACTIVE METHYLENE COUPLING COMPONENT

August Bauer, and Ernst Hoyer, both of Frankfurt am Main, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

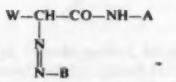
Filed Jan. 10, 1973, Ser. No. 322,374

Claims priority, application Germany, Jan. 12, 1972, 2201280

Int. Cl.² C09B *29/32, 29/36*

U.S. Cl. 260—193 **9 Claims**

1. A water-soluble monoazodyestuff of the formula



in which W is —CN or —CO—NH_2, A is β-sulfatoethylsulfonylphenyl, dimethoxy-(β-sulfatoethylsulfonyl)-phenyl, methylmethoxy-(β-sulfatoethylsulfonyl)-phenyl, methoxy-(β-sulfatoethylsulfonyl)-phenyl, dimethoxy-sulfo-phenyl, methylmethoxysulfo-phenyl, disulfonaphthyl, sulfo-(β-sulfatoethylsulfonyl)-naphthyl or (β-sulfatoethylsulfonyl-phenyl)-aminosulfonyl-phenyl, B is dimethoxy-sulfo-phenyl, methylmethoxy-sulfo-phenyl, disulfophenyl, methoxy-disulfophenyl, methyl-methoxy-(β-sulfatoethylsulfonyl)-phenyl, methoxy-(β-sulfatoethylsulfonyl)-phenyl, disulfonaphthyl, trisulfonaphthyl, sulfo-(β-sulfatoethylsulfonyl)-naphthyl, β-sulfatoethylsulfonyl-naphthyl, (methyl-methoxy-sulfo-phenyl)-amino-carbonyl-phenyl, (β-sulfatoethylsulfonyl-phenyl)-aminosulfonyl-phenyl, (β-sulfatoethylsulfonyl-nitro-phenyl)-amino-phenyl or (methylphenyl)-sulfonyl-sulfophenyl.

3,957,752
QUATERNIZED AZOANILINO TOLUENE SULFONAMIDOALKYLENE-AMINE DYES

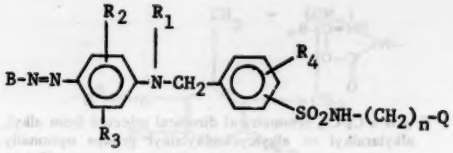
Edgar E. Renfrew, Lock Haven, Pa., assignor to American Aniline Products, Inc., Paterson, N.J.

Division of Ser. No. 303,429, Nov. 3, 1972, Pat. No. 3,881,866. This application Apr. 4, 1974, Ser. No. 457,978

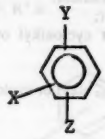
Int. Cl.² C09B *29/08, 29/26*

U.S. Cl. 260—205 **3 Claims**

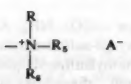
1. A dye of the formula



in which:
B is



wherein:
X, Y, and Z are members selected from the group consisting of hydrogen, nitro, chlorine, bromine, lower alkoxy, lower alkyl, cyano, sulfamyl, N-(lower alkyl)-sulfamyl, N,N-(dilower alkyl)sulfamyl lower alkylcarbonylamino, benzoylamino, lower alkylsulfonylamino, ,trifluoromethyl, lower alkyl sulfonyl, carbamoyl, N-(lower alkyl)-carbamoyl and N,N-(dilower alkyl)carbamoyl;
R_1 is lower alkyl, cyano lower alkyl, and hydroxy lower alkyl;
R_2, R_3 and R_4 are members selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, chlorine and bromine;
n is an integer having a value of 2-4;
Q is



R_5 and R_6 are methyl or ethyl;
R is hydrogen, methyl, or ethyl; and
A is a water soluble anion.

3,957,753

LIQUID HYDROXY-TERMINATED POLYESTERS

Fritz Hostettler, Verona; William H. Cook, Upper Montclair, both of N.J., and Frank G. Lombardi, Manchester, Conn., assignors to Inter-Polymer Corporation, Farmingdale, N.J.

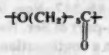
Continuation of Ser. No. 760,362, Sept. 17, 1968, abandoned, which is a continuation-in-part of Ser. No. 715,139, March 22, 1968, abandoned. This application May 22, 1974, Ser. No. 472,289

Int. Cl.² C07C *69/66*

U.S. Cl. 260—210 R **5 Claims**

1. Substantially primarily hydroxyl terminated linear and branched polyester polyols which remain liquid at ambient temperature prepared by the process which comprises simultaneously and substantially completely reacting:

i. e-caprolactone, 6-hydroxycaproic acid, a lower oligomer of 6-hydroxycaproic acid or mixture of the foregoing in an amount sufficient to provide from about 25 to 70 percent by weight of the oxycaproyl unit



ii. at least one dicarboxylic acid or dicarboxylic acid anhydride selected from the group consisting of adipic acid, succinic acid, glutaric acid, sebacic acid, pimelic acid and azelaic acid, their anhydrides and mixtures thereof; and
iii. at least two different glycols selected from the group consisting of ethylene glycol, 1,3-propanediol, 1,4-butanediol and 1,5-pentanediol, the molar ratio of the glycols being in the range of from about ⅓ to about 3.

3,957,754

COMPLEXES OF ANTIFUNGAL POLYENE ANTIBIOTICS

Adorjan Aszalos, Princeton, and John Vandeputte, Milltown, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 100,492, Dec. 21, 1970, Pat. No. 3,879,374. This application Jan. 13, 1975, Ser. No. 540,750

Int. Cl.² C07H *15/20*

U.S. Cl. 260—210 AB **6 Claims**

1. A complex having the name ferric nystatin.

3,957,755

NAPHTHACENE DERIVATIVES

Georges Jolles, Sceaux, France, assignor to Rhone-Poulenc S.A., Paris, France

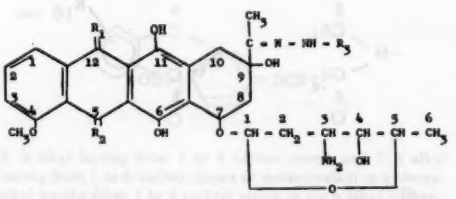
Continuation-in-part of Ser. No. 768,532, Oct. 17, 1968, abandoned. This application Oct. 7, 1971, Ser. No. 187,559

Claims priority, application United Kingdom, Oct. 18, 1967, 124943/67; Finland, Sept. 19, 1968, 2648/68; Oct. 11, 1968, 14582/68; Oct. 16, 1968, 203181/68; Oct. 16, 1968, 38326/68; Oct. 16, 1968, 106490/68; Japan, Oct. 17, 1968, 43-75538; Oct. 17, 1968, 43-494; France, Oct. 18, 1967, 67.124943

Int. Cl.² C07H *15/00*

U.S. Cl. 260—210 R **10 Claims**

1. A naphthacene of the formula:



wherein one of R_1 and R_2 is oxygen and the other is oxygen or :N - NHR_3, and R_3 is alkanoyl of up to 4 carbon atoms, alkanoyl of up to 4 carbon atoms substituted by a sulphonic acid group, alkanoyl of up to 4 carbon atoms substituted by a quaternary ammonium group, thiocarbamoyl, methylthiocarbamoyl amidino, or benzoyl, and non-toxic salts thereof.

3,957,756
PREPARATION OF SUBSTITUTED UREAS

Joachim Ribka, Offenbach (Main-Burgel), and Manfred Schon, Offenbach (Main), both of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

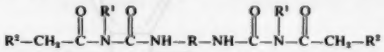
Filed Oct. 9, 1973, Ser. No. 404,269

Claims priority, application Germany, Oct. 13, 1972, 2250134

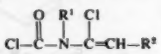
Int. Cl.² C07D *223/10*

U.S. Cl. 260—239.3 R **4 Claims**

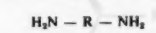
1. A process for preparing a substituted urea of the formula



wherein R^1 taken separately is alkyl having 1 to 8 carbon atoms, alkenyl having 3 to 8 carbon atoms, cycloalkyl having 5 to 6 carbon atoms or aryl having 6 to 12 carbon atoms; R^2 taken separately is hydrogen, alkyl having 1 to 18 carbon atoms, alkenyl having 2 to 18 carbon atoms, aralkyl hydrocarbon having 7 to 14 carbon atoms or aryl hydrocarbon having 6 to 12 carbon atoms or R^1 and R^2 taken together form a polymethylene bridge having 2 to 10 carbon atoms; R is alkylene having 1 to 6 carbon atoms, alkenylene having 3 to 8 carbon atoms, cycloalkylene having 5 to 6 carbon atoms, aralkylene hydrocarbon having 7 to 14 carbon atoms or arylene hydrocarbon having 6 to 12 carbon atoms or R is one of said radicals substituted by chlorine, bromine, nitro, alkyl having 1 to 4 carbon atoms, phenoxy or alkoxy having 1 to 4 carbon atoms, said process comprising the steps of reacting a carbamic acid chloride of the formula



with an amine of the formula



in the presence of an alkali metal hydroxide at a temperature of from 5° to 60°C. and in a molar ratio of 2 mols of said carbamic acid chloride reactant and 2 mols of said alkali metal hydroxide per mol of said amine reactant and then hydrolyzing the resulting intermediate at a temperature of from 20° to 100°C. to obtain said substituted urea of said formula.

4. The process of claim **1** wherein R^1 and R^2 are taken together and are a polymethylene bridge having 4 carbon atoms and R is — CH_2 — CH_2 — CH_2 — CH_2 — CH_2 — CH_2 —.

3,957,757
NOVEL DIBENZO (B,F) AZEPINES

André Allais, Les Lilas, and André Poittevin, Vaires-sur-Marne, both of France, assignors to Roussel-UCLAF, Paris, France

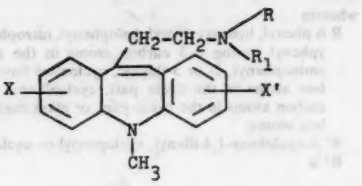
Continuation of Ser. No. 40,410, May 25, 1970, abandoned. This application Nov. 15, 1974, Ser. No. 523,978

Claims priority, application France, May 28, 1969, 69.17373

Int. Cl.² C07D *219/04, 223/22*

U.S. Cl. 260—239 D **9 Claims**

1. A compound selected from the group consisting of 5-methyl-10-(β-alkylaminoethyl) dibenzo (b,f) azepines of the formula



wherein R is lower alkyl, R_1 is selected from the group consisting of hydrogen and lower alkyl and X and X' are selected from the group consisting of hydrogen and halogen and their non-toxic, pharmaceutically acceptable acid addition salts.

3,957,758
6-ACYL DERIVATIVES OF AMINOPENICILLANIC ACID

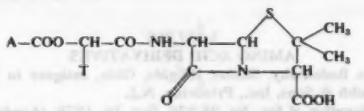
Andre Furlenmeier, Basel; Peter Quitt, Fullinsdorf; Karl Vogler, Riehen, and Paul Lanz, Muttenz, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 215,187, Jan. 3, 1972, Pat. No. 3,839,222. This application July 30, 1974, Ser. No. 492,947

Int. Cl.² C07D *499/44*

U.S. Cl. 260—239.1 **5 Claims**

1. Compounds represented by the formula



wherein A is pyridyl, 1-oxido-pyridyl, tetrahydropyranyl, pyrimidinyl, benzofuranyl, indolyl, quinolyl or isoquinolyl which may be substituted with halogen, oxo, hydroxy, C_1-C_3 alkyl, C_1-C_3 alkoxy, C_1-C_3 alkoxy charbonyl or C_1-C_3 alkanoylamino groups, and T is a C_2-C_5 alkyl, or C_2-C_5 alkenyl, cyclopropyl methyl, cyclobutylmethyl or cyclopentyl group and pharmaceutically acceptable salts are hydrated forms of said salts.

3,957,759
PENICILLINS

Harry Ferres, Horsham; Adrian Victor Kemmenoe, Westcott, and Desmond John Best, Sutton, all of England, assignors to Beecham Group Limited, Great Britain

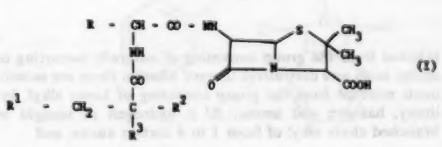
Division of Ser. No. 466,814, May 3, 1974. This application May 19, 1975, Ser. No. 578,722

Claims priority, application United Kingdom, May 4, 1973, 21203/73

Int. Cl.² C07D *499/68*

U.S. Cl. 260—239.1 **8 Claims**

1. A penicillin of formula (I):



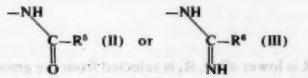
(I)

wherein

R is phenyl, hydroxyphenyl, halophenyl, nitrophenyl, alkoxyphenyl having 1–3 carbon atoms in the alkoxy part, aminophenyl, 2- or 3-thienyl, cycloalkyl having 3–7 carbon atoms in the cyclo part, cycloalkenyl having 5–7 carbon atoms in the cyclo part, or alkyl having 1–4 carbon atoms;

R^1 is cyclohexa-1,4-dienyl, cyclopropyl or cyclohexyl;

R^2 is



(II) or (III)

in which R^5 is amino, mono- or di-alkylamino having 1–4 carbon atoms in the alkyl part, cyclohexylamino, hydrogen, alkyl of 1–4 carbon atoms or phenyl, and R^6 is amino, mono- or di-alkylamino having 1–4 carbon atoms in the alkyl part or cyclohexylamino;

R^3 is hydrogen or alkyl of 1–3 carbon atoms; or a pharmaceutically acceptable salt or a pharmaceutically acceptable hydrolyzable ester which converts to the free acid from in vivo.

3,957,760

AMINO ACID DERIVATIVES

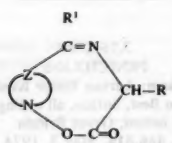
Miklos Bodanszky, Shaker Heights, Ohio, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 98,939, Dec. 16, 1970, abandoned, Continuation-in-part of Ser. No. 798,790, Feb. 12, 1969, abandoned, which is a continuation-in-part of Ser. No. 451,609, April 28, 1965, abandoned. This application Apr. 9, 1973, Ser. No. 349,503

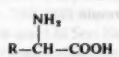
Int. Cl.² C07D *498/08*

U.S. Cl. 260—239.3 T **5 Claims**

1. A compound of the formula

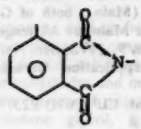


wherein R is the R group of an α-amino acid,



selected from the group consisting of naturally occurring α-amino acids and derivatives thereof wherein there are substituents selected from the group consisting of lower alkyl, hydroxy, halogen and amino, R^1 is hydrogen or straight or branched chain alkyl of from 1 to 4 carbon atoms, and

is



3,957,761

PROCESS FOR THE PRODUCTION OF 1-AMINOMETHYL-6-PHENYL-4H-S-TRIAZOLO-[4,3-A][1, 4]BENZODIAZEPINES AND INTERMEDIATES

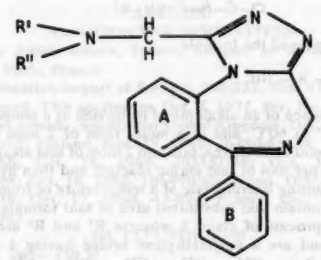
Martin Gall, Kalamazoo, and Jackson B. Hester, Jr., Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 332,293, Feb. 14, 1973, Pat. No. 3,842,090. This application June 19, 1974, Ser. No. 480,979

Int. Cl.² C07D *209/48*, *401/14*, *403/06*, *487/04*

U.S. Cl. 260—240 G **21 Claims**

1. A process for the production of a compound of formula V:

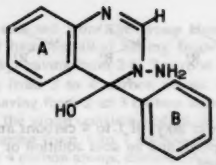


V

wherein R′ and R″ are alkyl of 1 to 3 carbon atoms, inclusive, or

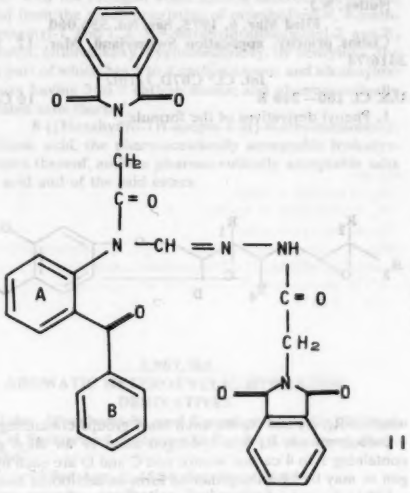
is pyrrolidino, piperidino, 4-methylpiperazino or morpholino, and wherein the rings A and B are unsubstituted, or substituted by one or more substituents selected from the group consisting of fluoro, chloro, bromo, nitro, and trifluoromethyl, which comprises:

1. treating in an inert organic solvent a mole equivalent of a compound of formula I:



I

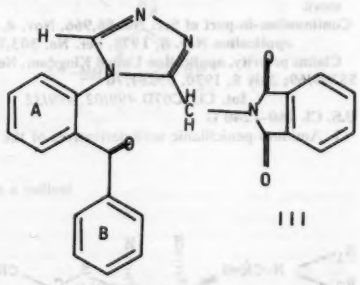
wherein rings A and B are defined as above, with two mole equivalents of α-phthalimidoacetyl chloride or bromide in the presence of an organic base at −5° to +15°C to give the corresponding compound II:



II

wherein rings A and B are defined as above;

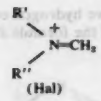
2. treating compound II with a halogenated acetic acid in an inert organic solvent at 80° to 125° C to obtain the corresponding compound III:



III

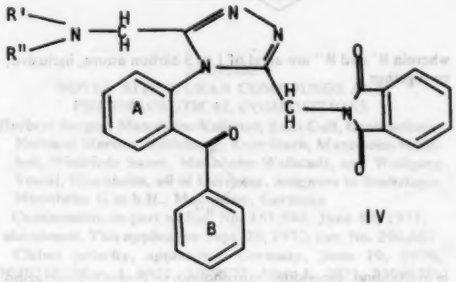
wherein rings A and B have the significance of above;

3. treating compound III with a substituted methyleneammonium halide compound of the formula:



wherein R',R'' or

are defined as above and Hal is chlorine or bromine, in a inert organic solvent at 25° to 100° C, to give the corresponding compound IV:



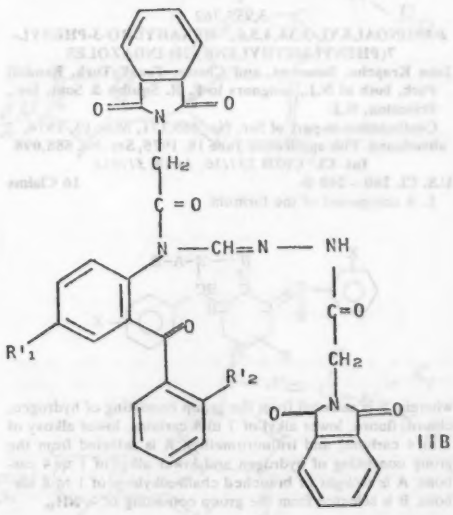
IV

wherein R', R'' or

and rings A and B are defined as above;

4. treating compound IV with hydrazine in an alkanol of 1 to 4 carbon atoms, inclusive at 25° to 100° to obtain the corresponding compound V, as defined above.

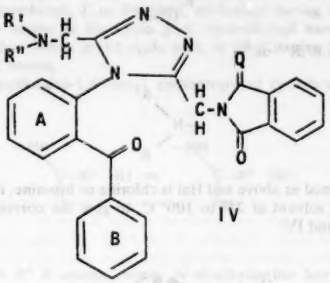
12. A compound according to claim 10 of the formula IIB:



IIB

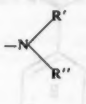
wherein R'_1 and R'_2 are hydrogen or chloro.

16. A compound of the formula IV:



IV

wherein R' and R'' are alkyl of 1 to 3 carbon atoms, inclusive, or together



is pyrrolidino, piperidino, morpholino, or N-methylpiperazino and wherein the rings A and B are unsubstituted or substituted with 1 to 2 substituents selected from the group consisting of fluoro, chloro, bromo, nitro, and trifluoromethyl.

3,957,762

2-AMINOALKYL-3,3A,4,5,6,7-HEXAHYDRO-3-PHENYL-7(PHENYLMETHYLENE)-2H-INDAZOLES

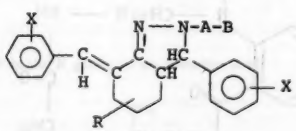
John Krapcho, Somerset, and Chester Frank Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 469,171, May 13, 1974, abandoned. This application June 18, 1975, Ser. No. 588,098

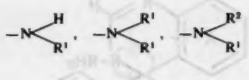
Int. Cl.² C07D *231/56;* **A61K** *31/415*

U.S. Cl. 260—240 D **16 Claims**

1. A compound of the formula:



wherein X is selected from the group consisting of hydrogen, chloro, fluoro, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, and trifluoromethyl; R is selected from the group consisting of hydrogen and lower alkyl of 1 to 4 carbons; A is straight or branched chain alkylene of 1 to 8 carbons; B is selected from the group consisting of $—NH_2$,



wherein R^1 is lower alkyl of 1 to 4 carbons and R^2 is phenyl, benzyl, or phenethyl; and an acid addition or quaternary salt or N-oxide thereof.

3,957,763

PHENYL DERIVATIVES

Madhukar Subraya Chodnekar, Seltisberg; Ulrich Schwieter, Reinach; Peter Loeliger, Pfaffhausen; Albert Pfiffner, Bulach; Milos Suchy, and Rene Zurfluh, both of Pfaffhausen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

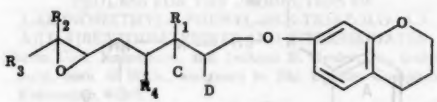
Filed Mar. 6, 1975, Ser. No. 556,060

Claims priority, application Switzerland, Mar. 12, 1974, 3416/74

Int. Cl.² C07D *311/02*

U.S. Cl. 260—240 R **16 Claims**

1. Phenyl derivatives of the formula:



wherein R_1, R_2 and R_3 are each alkyl groups containing 1 to 4 carbon atoms, R_4 is a hydrogen atom or an alkyl group containing 1 to 4 carbon atoms, and C and D are each hydrogen or may be taken together to form an additional bond.

3,957,764

6-AMINOPENICILLANIC ACID DERIVATIVES

Frantz Johannes Lund, Lyngby, Denmark, assignor to Lovens Kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark

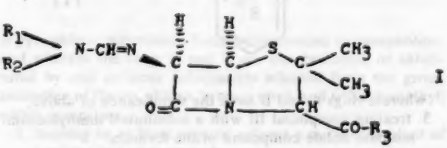
Continuation-in-part of Ser. No. 86,966, Nov. 4, 1970. This application Nov. 6, 1972, Ser. No. 303,715

Claims priority, application United Kingdom, Nov. 11, 1969, 55209/69; July 8, 1970, 33211/70

Int. Cl.² C07D *499/02, 499/32*

U.S. Cl. 260—240 G **21 Claims**

1. Amidino-penicillanic acid derivatives of the formula I:



I

in which R_1 is selected from the group consisting of alkyl, chloroalkyl and hydroxyl-alkyl having from 1 to 7 carbon atoms, alkoxyalkyl having from 2 to 7 carbon atoms, carbalkoxyalkyl having from 3 to 4 carbon atoms, cyanoalkyl and carbamylalkyl having from 2 to 3 carbon atoms, and allyl; R_2 is selected from the group consisting of alkyl, chloroalkyl and hydroxy-alkyl having from 1 to 7 carbon atoms, alkoxyalkyl having from 2 to 4 carbon atoms, carbalkoxyalkyl having from 3 to 4 carbon atoms, cyanoalkyl, or carbamylalkyl having from 2 to 3 carbon atoms and allyl; phenyl; phenyl substituted, chlorophenyl substituted, bromo-phenyl substituted, phenoxy substituted and carbobenzyloxy substituted methyl and ethyl; cycloalkyl and cycloalkyl-methyl having from 5 to 7 carbon atoms; methyl and ethyl substituted with furyl; and R_1 and R_2 form a straight or branched alkylene chain which together with the nitrogen atom form a saturated heterocyclic ring having from 4 to 8 carbon atoms; and R_1 and R_2 furthermore together with the nitrogen atom form a heterocyclic radical selected from the group consisting of morpholinyl-4, 4-methyl-piperazinyl-1, and 1, 2, 3, 4-tetrahydroisoquinolyl-2; and R_3 is hydroxyl, chloroalkoxy, cyanomethyloxy, or benzyloxy, the alkoxy part of which has 1 to 4 carbon atoms; and alkanoyloxymethoxy having 3 to 7 carbon atoms; and pharmaceutically acceptable salts thereof.

3. 6-[(Hexahydro-1H-azepin-1-yl)-methyleneamino]-penicillanic acid, the pharmaceutically acceptable hydrolyzable esters thereof, and the pharmaceutically acceptable salts of the acid and of the said esters.

3,957,765
AROMATIC HETEROCYCLIC HYDRAZIDE DERIVATIVES

Kurt Hofer, Munchenstein, and Guenther Tscheulin, Rieben, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

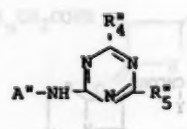
Filed Apr. 1, 1974, Ser. No. 456,630

Claims priority, application Switzerland, Apr. 5, 1973, 4917/73

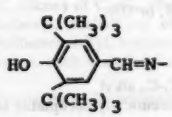
Int. Cl.² C07D *251/08, 401/14, 413/04, 413/14*

U.S. Cl. 260—240 G **10 Claims**

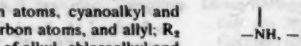
1. A compound of the formula:



wherein A'' is a radical



R_4'' is a group $-X''-R_{14}''$ wherein X'' is S,



and

R_{14}'' is alkyl (C_1-C_{12}), benzyl, phenyl or phenyl substituted by alkyl (C_1-C_4) or alkoxy (C_1-C_4),

a piperidino or morpholino ring or a radical $-NH-A''$ wherein A'' is as defined above, and

R_5'' has one of the significances of R_4''.

3,957,766
NOVEL NITROFURAN COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS

Herbert Berger, Mannheim-Kafertal; Rudi Gall, Grobsachsen; Hartmut Merdes, Heidelberg; Kurt Stach, Mannheim-Waldhof; Winfriede Sauer, Mannheim-Wallstadt, and Wolfgang Vomel, Mannheim, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

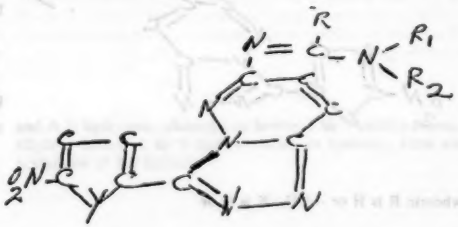
Continuation-in-part of Ser. No. 151,944, June 10, 1971, abandoned. This application Sept. 20, 1972, Ser. No. 290,682

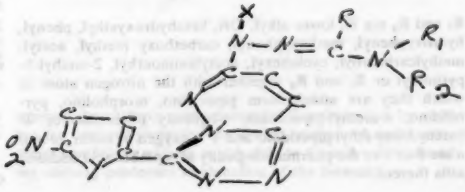
Claims priority, application Germany, June 19, 1970, 2030218; Mar. 1, 1971, 2109577; Mar. 1, 1971, 2109570; Oct. 29, 1971, 2153902

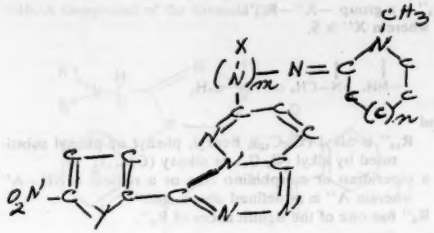
Int. Cl.² C07D *295/06, 295/12, 471/04*

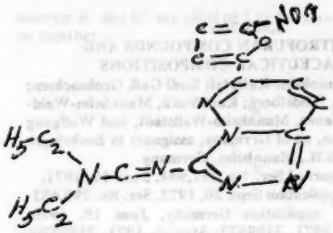
U.S. Cl. 260—240.1 **15 Claims**

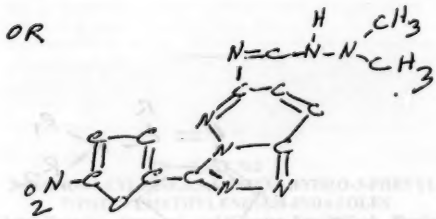
1. A compound of the formula











wherein R is H or $-CH_3$; X is H or

R_1 and R_2 are H, lower alkyl, OH, betahydroxyethyl, phenyl, hydroxyphenyl, methoxyphenyl, carbethoxy methyl, acetyl, methylcarbamoyl, cyclohexyl, acetylaminoethyl, 2-methyl-5-pyrimidyl or R_1 and R_2 together with the nitrogen atom to which they are attach form piperidino, morpholino, pyrrolidino, 4-methyl-piperazino, 4-hydroxy piperidino or 4-betahydroxy ethyl piperidino and Y is oxygen or sulfur, *m* and *n* are 0 or 1 or the pharmacologically acceptable acid addition salts thereof.

3,957,767

BASIC STYRYL DYES FREE FROM SULPHONIC ACID GROUPS, THEIR PRODUCTION AND USE

Viktor Kaeppeli, Allschwil, Basel-Land, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

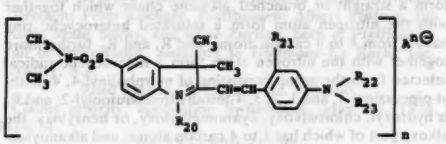
Continuation of Ser. No. 215,195, Jan. 3, 1972, abandoned. This application June 13, 1974, Ser. No. 479,121

Claims priority, application Switzerland, Jan. 8, 1971, 246/71

Int. Cl.[2] C07D *209/04*

U.S. Cl. 260—240.9 **3 Claims**

1. A compound of the formula



wherein

R_{20} is methyl or ethyl,

R_{21} is hydrogen or methyl,

R_{22} is methyl or ethyl,

R_{23} is phenyl monosubstituted in the para position by methyl, methoxy, ethoxy, chloro, or cyano,

$A^{n\ominus}$ is an anion, and

***n* is 1, 2 or 3.**

3,957,768

3-HETEROCYCLICTHIOMETHYLCEPHALOSPORINS

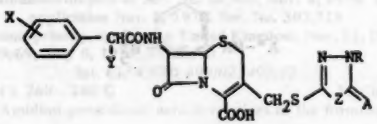
David Alan Berges, Audubon, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 306,507, Nov. 14, 1972, Pat. No. 3,868,369. This application Dec. 3, 1974, Ser. No. 529,141

Int. Cl.[2] C07D *501/20*

U.S. Cl. 260—243 C **6 Claims**

1. A compound of the formula



where

X is H, CH_2OH, SR, or OR;

Y is NH_2;

A is O or S;

Z is S; and

R is hydrogen or C_1-C_4 alkyl

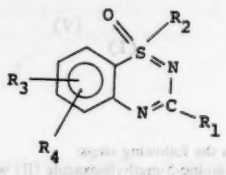
or a nontoxic pharmaceutically acceptable salt thereof.

3,957,769
1,2,4-BENZOTHIADIAZINES

Francis A. Sowinski, Edison, N.J., and B. Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 23, 1973, Ser. No. 418,496
Int. Cl.² C07D 285/24
U.S. Cl. 260—243 D 10 Claims

1. A compound having the structure



wherein R_1 is amino, alkylamino, or dialkylamino; R_2 is phenyl or phenyl substituted with halogen, nitro, trifluoromethyl, alkyl or alkoxy; R_3 is hydrogen, halogen, nitro, cyano, trifluoromethyl, alkyl, or alkoxy; R_4 is hydrogen or

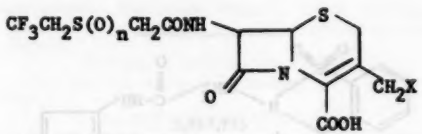
and R_5 is hydrogen or alkyl; or a pharmaceutically acceptable acid-addition salt thereof; wherein the terms alkyl and alkoxy refer to groups having 1 to 8 carbon atoms.

3,957,770
SUBSTITUTED ACETAMIDOCEPHALOSPORINS

Robert M. De Marinis, King of Prussia, Pa., assignor to Smith-Kline Corporation, Philadelphia, Pa.

Filed Dec. 26, 1973, Ser. No. 428,536
Int. Cl.² C07D 501/20
U.S. Cl. 260—243 C 12 Claims

1. A compound of the formula



where

n is 0, 1, or 2;

X is SHet; and

Het is a 5 or 6-membered heterocyclic ring containing carbon and 1–4 atoms selected from the group consisting of N, O, and S, unsubstituted or substituted with one or two substituents selected from the group consisting of alkyl of C_1–C_6, alkoxy of C_1–C_6, allyloxy, oxide, halogen, carbamyl, carboxyl, carbalkoxy of C_1–C_6, mercapto, methylthio, trifluoromethyl, hydroxy, amino, alkylamino and dialkylamino, each undefined alkyl having 1–6 carbon atoms

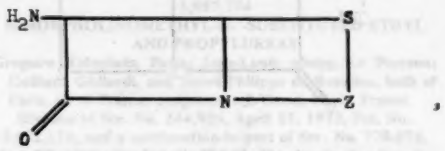
or a non-toxic pharmaceutically acceptable salt thereof.

3,957,771
PROCESS FOR THE MANUFACTURE OF AMINOAZETIDINONES

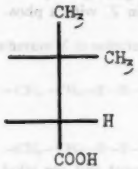
Dieter Bormann, Kelkheim, Taunus; Manfred Schorr, Frankfurt am Main, and Wilfried Schmitt, Kelkheim, Taunus, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, all of Germany

Filed May 3, 1973, Ser. No. 356,933
Claims priority, application Germany, May 5, 1972, 2222094
Int. Cl.² C07D 279/08, 277/60
U.S. Cl. 260—243 R 5 Claims

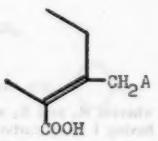
1. In a method for making an aminoazetidinone of the formula



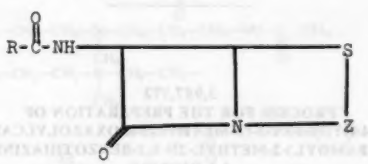
wherein Z is



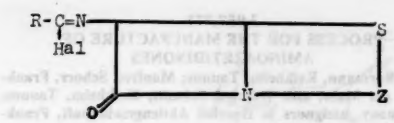
or



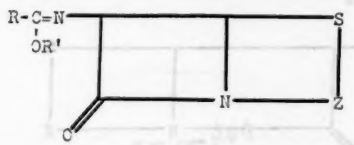
and A is hydrogen, alkanoyloxy having 1 to 5 carbon atoms, alkyloxy having 1 to 5 carbon atoms, or hydroxy, from an acylamino of the formula



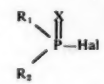
wherein the carboxy group present in Z is protected, by reacting the carboxy-protected acylamino compound under anhydrous conditions with an acid halide to form the corresponding carboxy-protected imidohalide of the formula



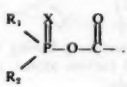
converting said carboxy-protected imidohalide into the corresponding carboxy-protected iminoether of the formula



by reaction with an alcohol, hydrolyzing the carboxy-protected iminoether with water to remove the carboxy protective group and to form the desired aminoazetidinone, and then precipitating the desired aminoazetidinone by adjusting the pH of the reaction mixture into the range of the isoelectric point, the improvement wherein the carboxy-protected acylamino compound is obtained by reacting a salt of the unprotected acylamino compound, said salt being formed by neutralization of the carboxy group present in Z, with a phosphinic acid halide of the formula



wherein R_1 and R_2 are the same or different and are alkyl having 1 to 10 carbon atoms, phenyl, or cycloalkyl having 5 to 7 carbon atoms, X is oxygen or sulfur, and Hal is halogen, to form a mixed acid anhydride between the carboxy group of Z and said phosphinic acid, which mixed acid anhydride contains the group



3,957,772

PROCESS FOR THE PREPARATION OF 4-HYDROXY-3-(5-METHYL-3-ISOXAZOLYLCARBAMOYL)-2-METHYL-2H-1,2-BENZOTHIAZINE 1,1-DIOXIDE

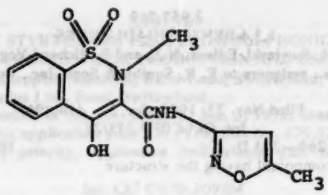
Arthur C. Fabian, Flanders; Jerome D. Genzer, Livingston; Charles Francis Kasulanis, Hopatcong; John Shavel, Jr., Mendham, and Harold Zinnes, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 21, 1975, Ser. No. 577,568

Int. Cl.[2] C07D 279/02

U.S. Cl. 260—243 R **16 Claims**

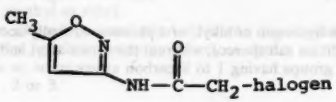
1. A process for preparing a compound of the formula I;



(I)

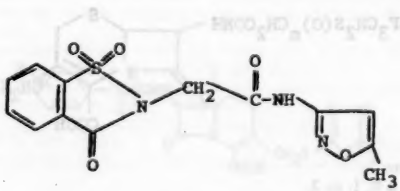
which comprises the following steps:

a. Reacting 3-amino-5-methylisoxazole (II) with a haloacetylhalide to form compound III:



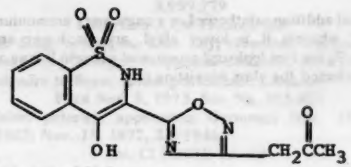
(III)

b. Reacting compound III with a salt of saccharin to form compound IV:



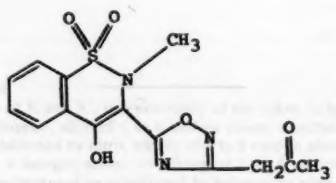
(IV)

c. Reacting compound IV with an alkali metal alkoxide of a lower alcohol in an inert solvent at a controlled temperature followed by acidification, to form compound V:



(V)

d. Methylating compound V by reaction, at a controlled temperature, with a methylating agent in an aqueous inert solvent containing excess base, followed by acidification, to obtain compound VI:



(VI)

e. Heating compound VI with an organic base in an inert solvent to obtain the desired compound I.

3,957,773
PROCESS FOR PREPARING CEPHALOSPORIN COMPOUNDS FROM 7-ADCA

Brian Burton, Ruislip, and William Graham, Gerrards Cross, both of England, assignors to Glaxo Laboratories Limited, Greenford, England

Filed July 2, 1974, Ser. No. 485,236

Claims priority, application United Kingdom, July 5, 1973, 32111/73

Int. Cl.² C07D *501/06*

U.S. Cl. 260—243 C **7 Claims**

1. In a process for the preparation of cephalexin the improvement which comprises the steps of (a) contacting a silylated derivative of 7β-amino-3-methylceph-3-em-4-carboxylic acid with phenylglycyl chloride hyrochloride in dimethylformamide at a temperature not exceeding 0°C in the presence of a tertiary nitrogen base having a pKa in the range 3.0–7.0, (b) diluting the dimethylformamide solution with water and adjusting the pH to about 6.9 to precipitate cephalexin bis-dimethylformamide solvate, (c) dissolving the solvate in a dilute aqueous mineral acid solution and heating the solution so formed and (d) contacting the heated solution with ammonia or an organic amine to precipitate cephalexin.

3,957,774
N-MORPHOLINOMETHYL-N-'-SUBSTITUTED ETHYL AND PROPYLUREAS

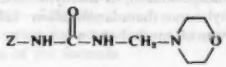
Gregoire Kalopissis, Paris; Jean-Louis Abegg, Le Perreux; Guiliana Ghilardi, and Henri Philippe de Beaulieu, both of Paris, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 244,906, April 17, 1972, Pat. No. 3,882,114, and a continuation-in-part of Ser. No. 770,074, Oct. 23, 1968, Pat. No. 3,678,157. This application Feb. 6, 1975, Ser. No. 547,394

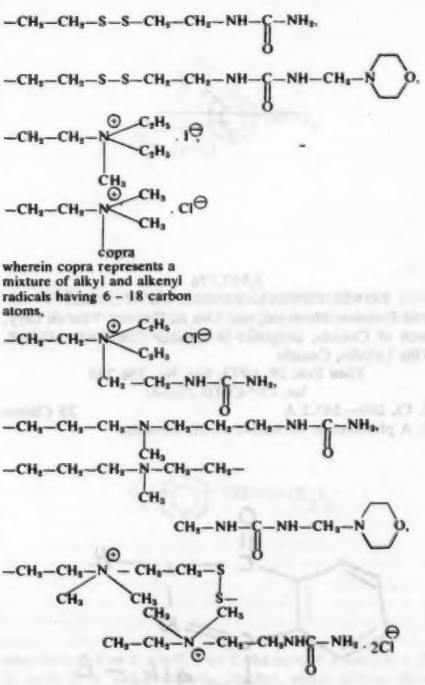
Int. Cl.² C07D *295/12, 295/14*

U.S. Cl. 260—246 B **2 Claims**

1. A compound of the formula



wherein Z is selected from the group consisting of



wherein copra represents a mixture of alkyl and alkenyl radicals having 6 – 18 carbon atoms,

$-C_{12}H_{25}$, and $-C_{18}H_{37}$.

3,957,775

SULFOSUCCINATE DERIVATIVES AS DETERGENT BUILDERS

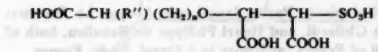
Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 394,613, Sept. 5, 1973, abandoned, which is a division of Ser. No. 156,933, June 25, 1971, abandoned. This application July 1, 1974, Ser. No. 484,920

Int. Cl.² C07C 143/00; C07D 295/00

U.S. Cl. 260—247.1 E 2 Claims

1. An α-carboxyalkoxy-β-sulfosuccinic acid having the general formula:



or the alkali metal, ammonium, monoethanolammonium, diethanolammonium, triethanolammonium, methylammonium, dimethylammonium, trimethylammonium, tetramethylammonium, morpholiniun, N-methylmonoethanolammonium and N-ethylmonoethanolammonium salt thereof, wherein R'' is hydrogen or methyl and n is zero or an integer from 1 to 3.

3,957,776

NOVEL PHTHALAZINONE COMPOUNDS

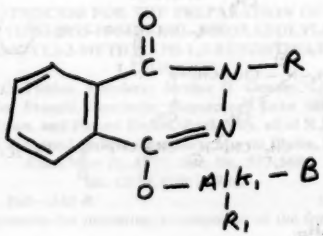
Ctirad Podesva, Montreal, and Lise A. Hughes, Ville de Lery, both of Canada, assignors to Delmar Chemicals Limited, Ville LaSalle, Canada

Filed Feb. 28, 1973, Ser. No. 336,740

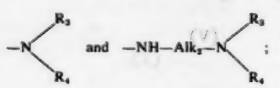
Int. Cl.² C07D 295/00

U.S. Cl. 260—247.2 A 25 Claims

1. A phthalazine derivative of the formula:



or an acid addition salt thereof or a quaternary ammonium salt thereof; wherein R is lower alkyl, aryl or lower aralkyl; wherein R_1 is a free hydroxyl group; and wherein B is an amino group selected the class consisting of



wherein Alk_1 represents a straight or branched-chain lower alkylene group interposing at least 3 carbon atoms in a direct or straight line between the oxygen and nitrogen atoms; wherein Alk_2 is a lower alkylene group; and wherein R_3 and R_4, when taken separately, are the same or different, and each is hydrogen, lower alkyl, aryl or lower aralkyl or, when taken together with the nitrogen atom to which they are attached, is a 5 or 6-membered heterocyclic ring, said heterocyclic ring formed by R_3 and R_4 can be interrupted by an oxygen atom or a nitrogen atom.

3,957,777

SUBSTITUTED NITROBENZOPHENONE DERIVATIVES

Edit Toth; Jozsef Torley; Eva Palosi; Szaboles Szeberenyi; Laszlo Szporny; Sandor Gorog, and Csilla Meszaros, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed July 3, 1974, Ser. No. 485,701

Claims priority, application Hungary, July 26, 1973, 11537

Int. Cl.² C07D 295/10

U.S. Cl. 260—247.7 R 1 Claim

1. 3-nitro-4-morpholino-benzophenone and pharmaceutically acceptable acid addition or quaternary ammonium salts thereof.

3,957,778

ISOCYANURATE COMPOUNDS AND PREPARATIVE PROCESSES

William J. Kauffman, Lititz, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 31, 1974, Ser. No. 537,689

Int. Cl.² C07D 251/34

U.S. Cl. 260—248 NS 4 Claims

1. 1,3-bis(carbethoxymethylene)-5-phenylisocyanurate.

3,957,779

BENZO-1,2,4-TRIAZINES

Florin Seng, Schildgen; Kurt Ley, Odenthal-Gloebusch, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

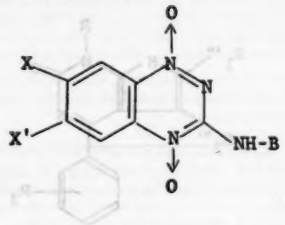
Filed Nov. 8, 1973, Ser. No. 413,887

Claims priority, application Germany, Nov. 15, 1972, 2255947; Nov. 15, 1972, 2255946

Int. Cl.² C07D *253/08*

U.S. Cl. 260—249.5 34 Claims

1. A compound of the formula:



wherein

each of X and X', independently of the other, is hydrogen; halogeno, alkyl of 1 to 6 carbon atoms, unsubstituted or substituted by nitro, alkoxy of 1 to 5 carbon atoms, or up to 5 halogen atoms; or alkoxy of 1 to 6 carbon atoms, unsubstituted or substituted by halogen or nitro; and

B is alkyl of 1 to 6 carbon atoms; alkenyl of 2 to 6 carbon atoms or benzyl.

3,957,780

SUBSTITUTED UREIDO-S-TRIAZINES

Hans-Hermann Grossmann, Oberems, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

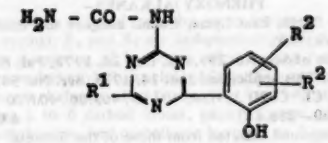
Filed Oct. 4, 1974, Ser. No. 512,022

Claims priority, application Germany, Oct. 8, 1973, 2350414

Int. Cl.² C07D *251/40, 251/48*

U.S. Cl. 260—249.5 7 Claims

1. Hydroxyphenyl-ureido-s-triazine of the formula



wherein R^1 represents a hydrogen atom, an alkyl or alkoxy radical each having from 1 to 6 carbon atoms; a phenyl or phenoxy radical each of which may be substituted by a hydroxy alkyl, alkoxy, nitro or amino group which may carry one or two alkyl radicals each having from 1 to 6 carbon atoms; or an amino group which may carry one or two alkyl radicals each having from 1 to 6 carbon atoms; and R^2 represents a hydrogen atom, a hydroxy group, an alkyl or alkoxy radical each having from 1 to 6 carbon atoms, or a phenyl radical.

3,957,781

PROCESS FOR PREPARING RING-PERCHLORINATED PYRAZINE-ISOCYANATES

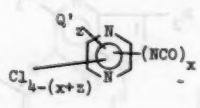
Sven H. Ruetman, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 258,074, May 30, 1972, abandoned. This application Feb. 6, 1974, Ser. No. 440,216

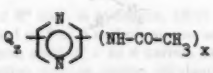
Int. Cl.² C07D *241/20*

U.S. Cl. 260—250 BN 6 Claims

1. A process for preparing a ring-perchlorinated pyrazine isocyanate of the formula



by rapidly and turbulently contacting one molecular proportion of a corresponding, prevaporized acetamido-substituted pyrazine starting material of the formula



wherein x is 1 or 2, z is 0, 1 or 2, the sum of x and z is 1, 2 or 3; each Q is, independently, methyl, nitro, chloro, fluoro, bromo, iodo, cyano, methoxy, CCl_3 or CF_3 and each Q' is a fluoro, cyano or $-CF_3$ group originally present in said starting

material as a substituent Q, with from about 15 to about 100 molecular proportions of chlorine at a temperature of from about 500° to 650°C. for from about 1 to 50 seconds.

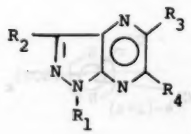
3,957,782

PYRAZOLO [3,4-B]PYRAZINE-5-CARBOXYLIC ACIDS, ESTERS, NITRILES AND AMIDES

Hans Hoehn, Tegernheim, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 16, 1974, Ser. No. 533,099
Int. Cl.² C07D *241/38*
U.S. Cl. 260—250 BC 23 Claims

1. A compound of the formula



wherein

R_1 is hydrogen, lower alkyl, phenyl, phenyl-lower alkyl or furfuryl;

R_2 is hydrogen, lower alkyl or phenyl;

R_3 is cyano or —COR wherein R is hydroxy, lower alkoxy, cyanomethoxy or

R_4 is hydroxy, lower alkoxy, lower alkylamino, lower alkyl or phenyl;

R_5 is hydrogen, lower alkyl or thiazole;

R_6 is hydrogen or lower alkyl; or R_5 and R_6 together with the nitrogen are pyrrolidino, piperidino, piperazino, (lower alkyl)piperidino, (lower alkyl)piperazino, morpholino or thiamorpholino;

said lower alkyl groups having up to seven carbon atoms, and salts thereof.

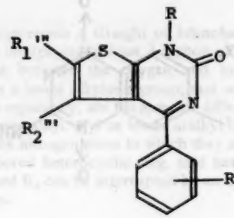
3,957,783

THIENO[2,3-D]PYRIMIDINE DERIVATIVES

Toshiyuki Hirohashi, Ashiya; Hiromi Sato; Shigeho Inaba, both of Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

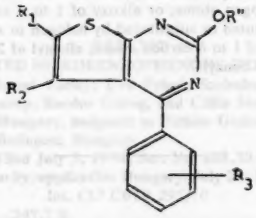
Filed May 7, 1973, Ser. No. 357,889
Claims priority, application Japan, May 9, 1972, 47-46038; July 3, 1972, 47-66828; July 26, 1972, 47-75420; Dec. 9, 1972, 47-12367; Dec. 14, 1972, 47-12594
The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.
Int. Cl.² C07D *495/04*
U.S. Cl. 260—251 A 5 Claims

1. A thienopyrimidine derivative of the formula,



wherein R is methyl, cyclopropylmethyl, β-ethoxyethyl, β-acetoxyethyl, methoxycarbonylethyl, β-methoxythioethyl or allyl; R_3 is hydrogen, halogen, methyl or nitro; and R_1''' and R_2''' together form tetramethylene.

2. A thienopyrimidine derivative of the formula,



[II]

wherein R_1 is hydrogen, methyl, ethyl, halogen or nitro; R_2 is hydrogen or methyl; and R_1 and R_2 may form tetramethylene; R_3 is hydrogen, halogen, methyl or nitro; and R'' is methyl, cyclopropylmethyl, β-ethoxyethyl, β-acetoxyethyl, methoxycarbonylmethyl, β-methylthioethyl or allyl.

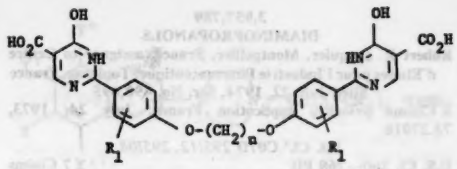
3,957,784

BIS(4-[4'-HYDROXY-5'-CARBOXY-2'-PYRIMIDINYL]-PHENOXY)ALKANES

Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 299,871, Oct. 24, 1972, Pat. No. 3,883,653. This application Jan. 14, 1975, Ser. No. 541,010
Int. Cl.² C07D *239/34, 403/04, 403/06, 403/10*
U.S. Cl. 260—256.4 C 4 Claims

1. A compound selected from those of the formula:



and the pharmaceutically acceptable basic salts thereof, wherein

R_1 is selected from the group consisting of hydrogen bromo, chloro, fluoro and methoxy; and

n is an integer of 1 to 3.

3,957,785

Bβ-PYRIMIDINO-AMINOMETHYL-10α-ERGOLINE AND 10α-METHOXYERGOLINE DERIVATIVES

Giuliana Arcari; Luigi Bernardi, both of Milan; Germano Bosisio, Palazzolo Milanese; Maurizio Foglio, Milan; Alfredo Glasser, Milan, and Aldemio Temperilli, Milan, all of Italy, assignors to Societa' Farmaceutici Italia S.p.A., Milan, Italy

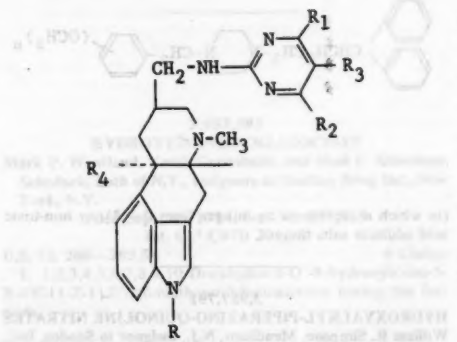
Continuation-in-part of Ser. No. 310,801, Nov. 30, 1972, abandoned. This application July 31, 1974, Ser. No. 493,335

Claims priority, application Italy, Dec. 2, 1971, 31932/71

Int. Cl.² C07D *457/02*

U.S. Cl. 260—256.4 C **22 Claims**

1. A compound of the formula:



wherein R is selected from the group consisting of hydrogen and methyl; R_1 and R_2 are independently selected from the group consisting of hydrogen, alkyl having 1 to 6 carbon atoms and phenyl; R_3 is selected from the group consisting of hydrogen, halogen, alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, phenyl, cyano, nitro, amino, dimethylamino, and carbalkoxy having 1 to 3 carbon atoms; and R_4 is selected from the group consisting of hydrogen and methoxy.

3,957,786

ARYL-SUBSTITUTED PIPERAZINYL-ALKYLAMINO-URACILS, -URACIL ETHERS AND -URACIL THIOETHERS AND METHOD FOR THEIR PRODUCTION

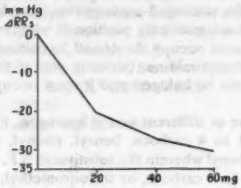
Kurt Klemm, Allensbach; Wolfgang Schoetensack, Konstanz, and Wolfgang Prusse, Hegne, all of Germany, assignors to Byk Gulden, Constance, Germany

Filed Aug. 20, 1970, Ser. No. 65,445

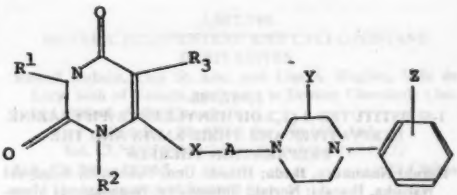
Claims priority, application Germany, Aug. 20, 1969, 1942405

Int. Cl.² C07D *239/54*

U.S. Cl. 260—256.4 C **29 Claims**



1. A compound of Formula I



I

wherein R^1 and R^2 each is hydrogen, alkyl of 1 to 4 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, and phenyl;

R^3 is hydrogen, alkyl of 1 to 4 carbon atoms, chlorine or bromine, nitro, nitroso, amino, alkylamino of 1 to 3 carbon atoms, dialkylamino wherein each of the alkyl groups contain 1 to 3 carbon atoms, alkanoylamino of 1 to 4 carbon atoms, formyl, ethoxycarbonylamino, thiocyanato, $COCH_3$ or $CONHC_6H_5$;

X is -NH-, $-NC_6H_5-$, -O- or -S-;

A is $-CH_2-CH_2-CH_2-$, $-CH(CH_3)-CH_2-$ or $-CH_2-CH(CH_3)$;

Z is hydrogen, a methyl group, one or two methoxy groups or an ethoxy group, a chlorine atom and Y is hydrogen, and the pharmaceutically acceptable salts of these compounds.

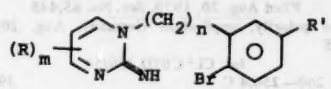
3,957,787

1,2-DIHYDRO-2-IMINO-1-(BROMOPHENYLALKYL)-PYRIMIDINES

Harry Louis Yale, New Brunswick, N.J., and Ramesh B. Petigara, Lansdale, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 382,804, July 26, 1973, Pat. No. 3,868,374. This application Dec. 16, 1974, Ser. No. 532,796
Int. Cl.² C07D 239/30, 239/42
U.S. Cl. 260—256.4 H 3 Claims

1. An intermediate of the formula



wherein

m is 1 or 2; when *m* is 1, R occupies either the 4- or 5-positions of the starting 2-aminopyrimidine, but when R is halogen it occupies only position-5; when *m* is 2, the two R-substituents occupy the 4- and 5-positions of the starting 2-aminopyrimidine, but only one of the two R-substituents can be halogen and it must occupy the 5-position;

R is the same or different and is hydrogen, F, Cl, Br, alkyl of from 1 to 4 carbons, benzyl, phenyl, or mono-substituted phenyl wherein the substituent is F, Cl, Br, I, alkyl of from 1 to 4 carbons, or trifluoromethyl;

R′ is hydrogen, F, Cl, Br, I, alklyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons, alkylthio of from 1 to 4 carbons, alkylsulfonyl wherein the alkyl radical has from 1 to 4 carbons, phenyl, phenyloxy, sulfamoyl, dialkylamidosulfonyl wherein each alkyl radical has from 1 to 4 carbons, trifluoromethyl, mono-substituted phenyl or mono-substituted phenyloxy wherein the substituent is F, Cl, Br, I, alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons or trifluoromethyl; *n* is 2 or 3.

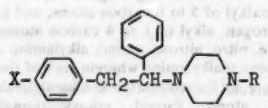
3,957,788

1-SUBSTITUTED-4-(1,2-DIPHENYLETHYL)PIPERAZINE DERIVATIVES AND THEIR SALTS AND THE PREPARATION THEREOF

Haruki Nishimura, Ikeda; Hitoshi Uno, Takatsuki; Kagayaki Natsuka, Ibaraki; Noriaki Shimokawa, Nagaokakyo; Masanao Shimizu, Kobe, and Hideo Nakamura, Tenri, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jan. 15, 1975, Ser. No. 541,351
Claims priority, application Japan, Jan. 23, 1974, 49-10470; Mar. 12, 1974, 49-28296; Mar. 14, 1974, 49-29683
Int. Cl.² C07D 295/08
U.S. Cl. 260—268 PH 23 Claims

1. A compound of the formula:



wherein X is hydroxy, methoxy, methyl or trifluoromethyl; and R is an unsubstituted monocycloalkyl group having 6 to 8 carbon atoms or 2-methoxyphenyl; provided that when X is hydroxy, R is cyclohexyl, and when X is trifluoromethyl, R is 2-methoxyphenyl,
or a pharmaceutically acceptable acid addition salt thereof.

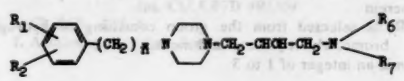
3,957,789

DIAMINOPROPANOLS

Robert R. Jacquier, Montpellier, France, assignor to Centre d'Etudes pour l'Industrie Pharmaceutique, Toulouse, France

Filed July 22, 1974, Ser. No. 490,495
Claims priority, application France, July 24, 1973, 73.27016
Int. Cl.² C07D 295/12, 295/08
U.S. Cl. 260—268 PH 7 Claims

1. A compound of the formula



wherein

R_1 and R_2 are Hydrogen, chlorine, fluorine, methyl, trifluoromethyl, methoxy, or when taken together, represent a methylenedioxy group;

R_6 is hydrogen or methyl;

R_7 is C_3–C_4 alkyl, benzyl or cyclohexyl;

n is zero or one; or the pharmaceutically acceptable acid addition and quaternary ammonium salts thereof.

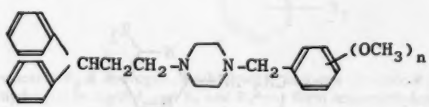
3,957,790

N-(3,3-DIPHENYLPROPYL)-N′-ARALKYL-SUBSTITUTED PIPERAZINES

Tadayuki Suzuki, Koshigaya, and Toshiharu Megumi, Misato, both of Japan, assignors to Tokyo Tanabe Company, Ltd., Japan

Filed Mar. 6, 1975, Ser. No. 555,827
Claims priority, application Japan, Mar. 12, 1974, 49-27745
Int. Cl.² C07D 295/08, 209/02
U.S. Cl. 260—268 BZ 9 Claims

1. A compound of the formula



(in which *n* represents an integer from 0 – 3), or non-toxic acid addition salts thereof.

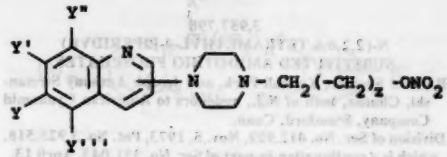
3,957,791

HYDROXYALKYL-PIPERAZINO-QUINOLINE NITRATES

William R. Simpson, Mendham, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 291,833, Sept. 25, 1972, Pat. No. 3,856,796, which is a continuation-in-part of Ser. No. 245,308, April 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 127,376, March 23, 1971, abandoned. This application Sept. 9, 1974, Ser. No. 504,427
Int. Cl.² C07D 401/04
U.S. Cl. 260—268 BQ 6 Claims

1. A compound of the formula:



wherein z is 1 to 4, and each of Y, Y', Y'' and Y''' is hydrogen, fluoro, chloro, bromo, alkoxy of 1 to 3 carbon atoms or alkyl of 1 to 3 carbon atoms, or Y and Y' together form methylenedioxy, provided that at least 2 of Y, Y', Y'' and Y''' are hydrogen and further provided that when one of Y, Y', Y'' and Y''' is fluoro, chloro or bromo, then the others are hydrogen, or a pharmaceutically acceptable acid addition salt thereof.

3,957,792
PROCESS FOR PREPARING 2-ETHYL-PYRIDINE

Hans-Jürgen Arpe, Fischbach, Taunus, and Hansjörg Hey, Langenhain, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 6, 1974, Ser. No. 476,992

Claims priority, application Germany, June 8, 1973, 2329389

Int. Cl.² C07D *213/06*

U.S. Cl. 260—290 R **6 Claims**

1. A process for the preparation of 2-ethyl-pyridine which comprises reacting 2-methyl-pyridine and methanol in the gaseous state at a reaction temperature in the range of about 200°C. to about 600°C. in the presence of a catalyst composition consisting essentially of silicon dioxide and an oxide of an element of the lanthanide series of the Periodic System or a mixture of such oxides to form 2-ethyl-pyridine, which catalyst composition is activated by heating to about 150°C. to about 850°C.

3,957,793
HYDROXYIMINOBENZAZOCINES

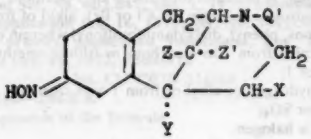
Mark P. Wentland, North Greenbush, and Noel F. Albertson, Schodack, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Sept. 20, 1974, Ser. No. 507,965

Int. Cl.² C07D *221/26*

U.S. Cl. 260—293.54 **6 Claims**

1. 1,2,3,4,5,6,7,8,9,10-Decahydro-3-Q'-8-hydroxyimino-5-X-6Y-11-Z-11Z'-2,6-methano-3-benzazocine having the formula



wherein:

Q' is hydrogen, benzyl, propyl, isobutyl, neopentyl, allyl, 2-methyl-2-propenyl, 2-chloro-2propenyl, cis-3-chloro-2-propenyl, cis-3-chloro-2-butenyl, trans-3-chloro-2-butenyl, propargyl, cyclopropylmethyl or (2,2-dichlorocyclopropyl)-methyl;

X is hydrogen, methyl or ethyl;

Y is hydrogen, methyl, ethyl, propyl, allyl or phenyl;

Z is hydrogen, methyl, ethyl or hydroxyl; and

Z' is hydrogen, methyl or ethyl;

or an acid addition salt thereof.

3,957,794
3-AMINO-2,3,3A,6,7,7A-HEXAHYDRO-THIENO[3,2-B]PYRIDIN-(4H)5-ONE

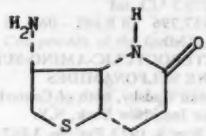
Enrico Baggiolini, Nutley; Pasquale Nicholas Confalone, Bloomfield; Giacomo Pizzolato, Belleville, and Milan Radoje Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 2, 1975, Ser. No. 574,080

Int. Cl.² C07D *333/00*

U.S. Cl. 260—293.55 **1 Claim**

1. A compound of the formula:



XII

the racemates and optical antipodes thereof.

3,957,795
NOVEL CYCLOPENTENE AND CYCLOPENTANE DERIVATIVES

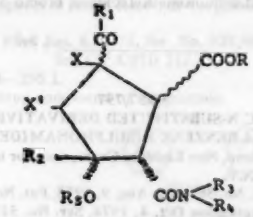
Rudolf Kubela, Cote St. Luc, and Lise A. Hughes, Ville de Lery, both of Canada, assignors to Delmar Chemicals Limited, Ville LaSalle, Canada

Filed Jan. 28, 1974, Ser. No. 437,163

Int. Cl.² C07C *103/737*; C07D *245/18*, *211/32*

U.S. Cl. 260—293.65 **23 Claims**

1. The compound of formula I:



I

wherein:

R and R_2 each individually represent a hydrogen atom or an alkyl group having 1 to 6 carbon atoms;

R_1 represents an alkyl group having 1 to 6 carbon atoms;

R_3 and R_4 each individually represent an alkyl group having 1 to 6 carbon atoms or an aralkyl group having 1 to 6 carbon atoms in the alkyl moiety and wherein the aryl moiety is a phenyl group, or the saturated heterocyclic ring represented by

has the formula:

wherein R_3 and R_4 each individually represent an alkylene group which contains 2 or 3 carbon atoms, Z is 0 or N and n is zero or 1;

R_5 in OR_5 is selected from the group consisting of hydrogen, an alkyl group having 1 to 6 carbon atoms, an acyl group having the formula alkyl—CO— wherein the alkyl moiety has 1 to 6 carbon atoms, and a carbamoyl group having the formula R_6 —NHCO— wherein R_6 is an alkyl group having 1 to 6 or a phenyl group or a phenyl group substituted by halogen or nitro or $—CF_3$; and X and X′ represent hydrogen atoms, or, when taken together, a double bond.

3,957,796

2 AND 3-SUBSTITUTED-4-(HETEROCYCLIC-AMINO-SULFONYL)BENZENE SULFONAMIDES

Peter Edward Cross, and Brian Gadsby, both of Canterbury, England, assignors to Pfizer Inc., New York, N.Y.

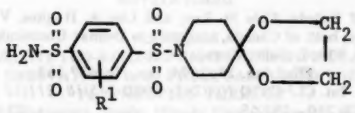
Division of Ser. No. 386,854, Aug. 9, 1973, Pat. No. 3,867,390. This application Oct. 4, 1974, Ser. No. 512,009

Claims priority, application United Kingdom, Aug. 12, 1972, 37720/72

Int. Cl.² C07D *221/20*

U.S. Cl. 260—293.66 **3 Claims**

1. A compound selected from the group consisting of



and the salts thereof with pharmaceutically acceptable cations wherein R′ is 3-trifluoromethyl, chloro, bromo or fluoro.

3,957,797

CYCLIC N-SUBSTITUTED DERIVATIVES OF 1,4-BENZENE DISULPHONAMIDE

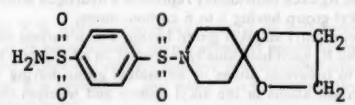
Gerald F. Holland, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 386,853, Aug. 9, 1973, Pat. No. 3,867,391. This application Oct. 4, 1974, Ser. No. 512,013

Int. Cl.² C07D *221/20*

U.S. Cl. 260—293.66 **1 Claim**

1. A compound selected from the group consisting of



and the salts thereof with pharmaceutically acceptable cations.

3,957,798

N-(2,2,6,6-TETRAMETHYL-4-PIPERIDYL) SUBSTITUTED AMIDOTHIO PHOSPHATES

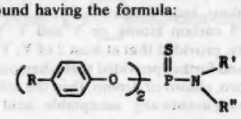
Richard Spector, Kendall Park, and Joseph Anthony Stretanski, Clinton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 412,922, Nov. 5, 1973, Pat. No. 3,925,518, which is a continuation-in-part of Ser. No. 351,043, April 13, 1973, Pat. No. 3,923,733. This application Apr. 7, 1975, Ser. No. 565,886

Int. Cl.² C07D *211/58*

U.S. Cl. 260—293.73 **2 Claims**

1. A compound having the formula:



wherein: R is alkyl of 1-6 carbons, or halogen;

R′ is 2,2,6,6tetramethyl-4-piperidyl; and R″ is hydrogen or R′.

3,957,799

SULFUR CONTAINING AMINO AND IMINO PYRIDINES

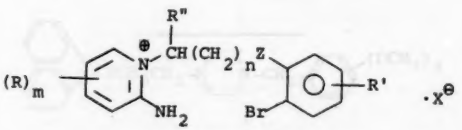
Harry Louis Yale, New Brunswick, N.J., and Ramesh B. Petigara, Lansdale, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 347,938, April 4, 1973, Pat. No. 3,857,850. This application Sept. 13, 1974, Ser. No. 505,812

Int. Cl.² C07D *213/04*

U.S. Cl. 260—294.8 F **2 Claims**

1. A compound having the formula



wherein *m* is 1 or 2;

R is the same or different and is hydrogen, halogen (F, Cl, or Br), alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons, alkylthio of from 1 to 4 carbons, benzyl, phenethyl, phenyl, phenoxy, phenylthio or mono-substituted phenyl wherein the substituent may be halogen (F, Cl, Br or I), alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons, or trifluoromethyl; provided that when R is halogen, R occupies only the 3- or 5-position;

R′ is hydrogen, halogen (F, Cl or Br), alkyl of from 1 to 4 carbons, phenyl, dialkylamidosulfonyl wherein each alkyl radical is from 1 to 4 carbons or trifluoromethyl;

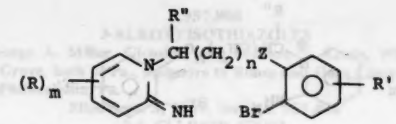
n is 0 or 1;

R″ is hydrogen or alkyl of from 1 to 4 carbons;

Z is S or SO_2;

and X is halogen.

2. A compound having the formula



wherein

m is 1 or 2;

R is the same or different and is hydrogen, halogen (F, Cl, or Br), alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons, alkylthio of from 1 to 4 carbons, benzyl, phenethyl, phenyl, phenoxy, phenylthio or mono-substituted phenyl wherein the substituent may be halogen (F, Cl, Br or I), alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons, or trifluoromethyl; provided that when R is halogen, R occupies only the 3- or 5-position;

R′ is hydrogen, halogen (F, Cl or Br), alkyl of from 1 to 4 carbons, phenyl, dialkylamidosulfonyl wherein each alkyl radical is from 1 to 4 carbons or trifluoromethyl;

n is 0 or 1;

R″ is hydrogen or alkyl of from 1 to 4 carbons;

and Z is S or SO_2.

3,957,800

PROCESSES AND INTERMEDIATES FOR CIS OR TRANS 2- OR 3-(1-ACYL-3-VINYL-4-PIPERIDINE)ACETIC OR PROPIONIC ACID ESTERS

Güenter Grethe, North Caldwell, and Milan Radoje Uskokovic, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 362,604, May 21, 1973, which is a division of Ser. No. 100,370, Dec. 21, 1970, abandoned. This application May 23, 1975, Ser. No. 580,492

Int. Cl.² C07D *211/34*

U.S. Cl. 260—293.88 **3 Claims**

1. A process for the preparation of cis or trans 2-(1-acyl-3-vinyl-4-piperidine)acetic acids or esters, antipodes or racemates thereof or cis or trans 3-(1-acyl-3-vinyl-4-piperidine) propionic acids or esters or antipodes or racemates thereof which comprises the steps of:

a. treating the corresponding cis or trans 2- or 3-(3-ethyl-4-piperidine)acetic or propionic acid or ester, antipode or racemate thereof with a chlorinating agent;

b. irradiating the product of step (a), i.e., cis or trans 2- or 3-(1-chloro-3-ethyl-4-piperidine)acetic or propionic acid or ester, antipode or racemate thereof;

c. treating the product of step (b), i.e., cis or trans 2- or 3-[3-(2-chloroethyl)-4-piperidine]acetic or propionic acid or ester, antipode or racemate thereof, with an acid chloride; and

d. pyrrolyzing the product of step (c), i.e., cis or trans 2- or 3-[1-acyl-3-(2-chloroethyl)-4-piperidine]acetic or propionic acid or ester, antipode or racemate thereof, to yield the desired end product.

3,957,801

O,S-DIALKYL ESTERS OF PYRIDYLTHIO- AND PYRIDYLDITHIOPHOSPHORIC ACID

Jozef Drabek; Ernst Beriger, both of Allschwil, and Beat Bohner, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

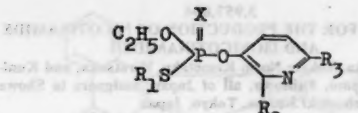
Division of Ser. No. 402,647, Oct. 1, 1973, abandoned. This application Jan. 16, 1975, Ser. No. 541,535

Claims priority, application Switzerland, Aug. 20, 1973, 12130/73; Oct. 13, 1972, 15040/72

Int. Cl.² C07D *213/52*

U.S. Cl. 260—294.8 K **9 Claims**

1. Compounds of the formula



wherein

R_1 represents n-propyl, isobutyl, sec.-butyl or n-pentyl,

R_2 represents hydrogen, chlorine or bromine

R_3 represents hydrogen, chlorine, bromine or methyl, and

X represents oxygen or sulphur.

3,957,802

O,S-DIALKYL ESTERS OF PYRIDYLTHIO- AND PYRIDYLDITHIO-PHOSPHORIC ACID

Jozef Drabek; Ernst Beriger, both of Allschwil, and Beat Bohner, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

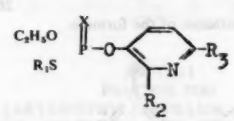
Division of Ser. No. 402,647, Oct. 1, 1973, abandoned. This application Jan. 16, 1975, Ser. No. 541,538

Claims priority, application Switzerland, Oct. 13, 1972, 15040/72; Aug. 24, 1973, 12130/73

Int. Cl.² C07D *213/52*

U.S. Cl. 260—294.8 K **4 Claims**

1. Compounds of the formula



wherein

R_1 represents n-propyl, isobutyl, sec.-butyl or n-pentyl,

R_2 represents cyano, nitro (C_1-C_4-alkoxy)carbonyl, mono(C_1-C_4-alkyl)-carbamoyl or di(C_1-C_4-alkyl)carbamoyl,

R_3 represents hydrogen, chlorine, bromine or methyl, and

X represents oxygen or sulphur.

3,957,803

CERTAIN TRANSIENT PRO-DRUG FORMS OF PHENYLBUTAZONE

Nicolae S. Bodor, and Kenneth B. Sloan, both of Lawrence, Kans., assignors to Interx Research Corporation, Lawrence, Kans.

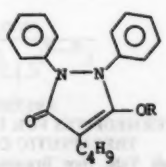
Filed Jan. 6, 1975, Ser. No. 538,903

Int. Cl.² C07D *213/81*

U.S. Cl. 260—295 L **16 Claims**

1. A pro-drug compound of the formula:

(I)



wherein R represents a member selected from the group consisting of a nicotinoyl group, an iso-nicotinoyl group, a picolinoyl group, an N-protected naturally occurring amino acid residue, wherein the protective group on the amino group of the amino acid residue is removable via hydrogenolysis or hydrolysis, and an amino acid residue containing a C_1–C_2 N,N-dialkylamino or a C_4–C_6 cycloalkylamino group.

3,957,804

METHOD FOR THE PRODUCTION OF NICOTINAMIDE AND ISONICOTINAMIDE

Ryoji Ishioka, Tokyo; Norio Kametaka, Hiratsuka, and Kuniomi Marumo, Fujisawa, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 4, 1975, Ser. No. 610,406

Claims priority, application Japan, Sept. 11, 1974, 49-103789

Int. Cl.² C07D 213/56

U.S. Cl. 260—295 AM 9 Claims

1. A method for the production of nicotinamide or isonicotinamide by catalytically hydrating 3-or 4-cyanopyridine which is characterized in that the hydration reaction is carried out in the presence of a nickel oxide/iron oxide combined catalyst.

3,957,805

SUBSTITUTED PYRIDINES AND DIAZINES AND METHODS OF PREPARING THE SAME

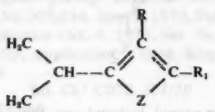
William Joseph Fanshawe; Gretchen Ellen Wiegand, both of Pearl River; Lantz Stephen Crawley, Spring Valley, all of N.Y., and Sidney Robert Safir, River Edge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed July 24, 1974, Ser. No. 491,449

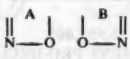
Int. Cl.² C07D 213/42

U.S. Cl. 260—296 R 26 Claims

1. A cyclopropylisoxazole of the formula:



wherein R is a member of a group consisting of hydrogen, lower alkyl, lower cycloalkyl and phenyl; R_1 is pyridyl; Z is a trivalent radical selected from the group consisting of A and B



and the dotted line represents one double bond, the position being dependent upon the definition of Z and when Z is B, the double bond is adjacent to the cyclopropyl substituent and when Z is A, the double bond is in the other position with the proviso that when Z is B and R is as defined above the carbon to carbon double bond may also be absent, and a pharmaceutically acceptable salt thereof.

3,957,806

INTERMEDIATES FOR USE IN PREPARING THERAPEUTIC COMPOUNDS

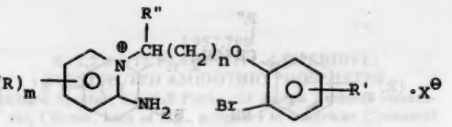
Harry Louis Yale, New Brunswick, N.J., and Ramesh B. Petigara, Lansdale, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 347,939, April 4, 1973, Pat. No. 3,856,801. This application Aug. 28, 1974, Ser. No. 501,326

Int. Cl.² C07D 213/73

U.S. Cl. 260—296 R 2 Claims

1. A compound of the formula



wherein m is 1 or 2

R is the same or different and is hydrogen, halogen (F, Cl, or Br), alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons, alkylthio of from 1 to 4 carbons, benzyl, phenethyl, phenyl, phenoxy, phenylmercapto or mono-substituted phenyl wherein the substituent may be halogen (F, Cl, Br or I), alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons, or trifluoromethyl; provided that when R is halogen, R occupies only the 3- or 5-position in the original 2-aminopyridine:

R′ is hydrogen, halogen (F, Cl, Br or I), alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons, alkyl-mercapto of from 1 to 4 carbons, alkylsulfonyl wherein the alkyl radical has from 1 to 4 carbons, phenyl, phenyloxy, sulfamoyl, dialkylamidosulfonyl wherein each alkyl radical may have from 1 to 4 carbons, trifluoromethyl, mono-substituted phenyl or mono-substituted phenyloxy wherein the substituent may be halogen (F, Cl, Br or I), alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons or trifluoromethyl; provided that R′ occupies the position para to the carbon atom joined to oxygen and R′ is alkylsulfonyl, sulfamoyl, dialkylamidosulfonyl, phenyl, phenoxy, mono-substituted phenyl or mono-substituted phenoxy;

n is 0 or 1;

and R″ is hydrogen or alkyl of from 1 to 4 carbons, and X is halogen.

3,957,807

PROCESS FOR MANUFACTURE OF BIPYRIDYLS

Sheila Antoinette Potter, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 379,308, July 16, 1973, which is a division of Ser. No. 171,349, Aug. 12, 1971, Pat. No. 3,787,427. This application July 9, 1975, Ser. No. 594,551

Claims priority, application United Kingdom, Aug. 17, 1970, 39481/70

Int. Cl.² C07D 213/22

U.S. Cl. 260—296 D 10 Claims

1. A process for the manufacture of a 2,2′-bipyridyl, a 2,4′-bipyridyl or a 4,4′-bipyridyl which consists essentially of heating pyridine in the liquid phase under substantially anhydrous conditions with a member selected from the group consisting of a 4-halopyridine and the hydrohalide addition salts thereof at a temperature of at least 150°C and up to 400°C.

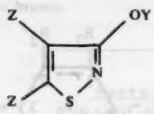
3,957,808

3-ALKOXYISOTHIAZOLES

George A. Miller, Glenside, and Sheldon N. Lewis, Willow Grove, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Sept. 3, 1969, Ser. No. 855,048
Int. Cl.² C07D 275/02
U.S. Cl. 260—302 A 5 Claims

1. A compound of the formula



wherein

Y is an alkyl group of 1 to 18 carbon atoms; a cycloalkyl group of 3 to 8 carbon atoms; a benzyl group; a halogen-, (C_1-C_4)alkyl-, or (C_1-C_4)alkoxy-substituted benzyl group; a carbalkoxyalkyl group of up to 12 carbon atoms; a dialkylaminoalkyl group of up to 12 carbon atoms; a haloalkyl group of up to 12 carbon atoms; an alkoxyalkyl group of up to 12 carbon atoms; an alkylthioalkyl group of up to 12 carbon atoms; an alkenyl group of up to 12 carbon atoms; or an alkynyl group of up to 12 carbon atoms;

Z is hydrogen, halogen, or a (C_1-C_4)alkyl group; and

Z′ is hydrogen, halogen, or a (C_1-C_4)alkyl group; and the salts thereof with a strong acid.

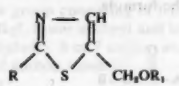
3,957,809

CERTAIN 2-ALKYL-5-OXYMETHYLTHIAZOLES

Michel Hardy, Maisons-Alfort, and Daniel Humbert, Paris, both of France, assignors to Roussel-UCLAF, Paris, France

Filed Aug. 8, 1974, Ser. No. 495,556
Claims priority, application France, Aug. 29, 1973, 73.31182
Int. Cl.² C07D 277/24
U.S. Cl. 260—302 R 4 Claims

1. A compound of the formula



wherein R is alkyl of 2 to 12 carbon atoms and R_1 is selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms and acyl of an organic carboxylic acid of 1 to 12 carbon atoms selected from the group consisting of alkanoic acids, cycloalkylcarboxylic acids, cycloalkylalkanoic acids, benzoic acid, and phenyl alkanoic acids.

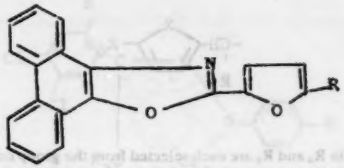
3,957,810

PHENANTHRO OXAZOLE PHOSPHOR COMPOUNDS

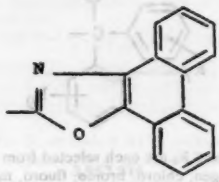
Jury Nikolaevich Tsibizov, Bulvar Mira 12, kv. 96, Nevinomyssk; Fedor Tikhonovich Pozharsky, ulitsa Engelsa, 81, kv. 8, Rostov-na-Donu; Andrei Mikhailovich Simonov, ulitsa Engelsa, 81, kv. 48, Rostov-na-Donu; Mikhail Isaakovich Knyazhansky, Universitetsky pereulok, 131 B, kv. 88, Rostov-na-Donu, and Mikhail Borisovich Strjukov, ulitsa Engelsa, 34, kv. 30, Rostov-na-Donu, all of U.S.S.R.

Filed Sept. 24, 1973, Ser. No. 399,714
Int. Cl.² C07D 263/52
U.S. Cl. 260—307 D 1 Claim

1. A compound of the formula:



where R = CHO, $COCH_3$, COOH, or



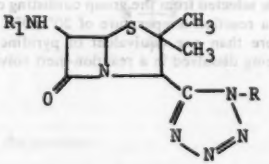
3,957,811

PROCESS FOR 3-(1-[ARYLMETHYL]TETRAZOL-5-YL)PENAMS

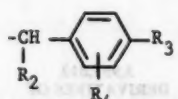
Susumu Nakanishi, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 9, 1974, Ser. No. 513,214
Int. Cl.² C07D 498/04
U.S. Cl. 260—306.7 R 7 Claims

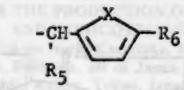
1. A process for the preparation of-a compound of the formula



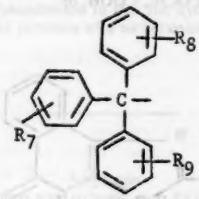
wherein R is selected from the group consisting of substituted benzyl of the formula



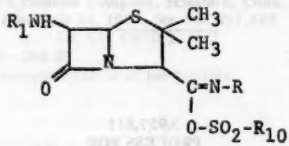
wherein R_2 is selected from the group consisting of hydrogen, alkyl having from one to three carbon atoms and phenyl and R_3 is selected from the group consisting of hydroxy, methoxy, alkanoyloxy having two to four carbon atoms, and benzyloxy and R_4 is selected from the group consisting of hydrogen, hydroxy, fluoro, chloro, bromo, iodo, methyl, methoxy, alkanoyloxy having from two to four carbon atoms, phenyl and benzyloxy and



wherein R_5 and R_6 are each selected from the group consisting of hydrogen and methyl and X is selected from the group consisting of oxygen and sulfur; and R_1 is



wherein R_7, R_8 and R_9 are each selected from the group consisting of hydrogen, chloro, bromo, fluoro, methyl, methoxy and phenyl, which comprises contacting an imino sulfonate of the formula



wherein R_{10} is selected from the group consisting of alkyl having 1 to 4 carbon atoms, phenyl and substituted phenyl wherein said substituent is selected from the group consisting of methyl and nitro, with one to three equivalents of an azide of the formula

MN_3

wherein M is selected from the group consisting of NH_4, Li, H and Na, at a reaction temperature of 20°–60°C. in the presence of more than one equivalent of pyridine, said imino sulfonate being dissolved in a reaction-inert solvent.

3,957,812

DERIVATIVES OF 2-PHENOXYACETAMIDO-5-NITRO-THIAZOLE

Jean-Francois Rossignol, Paris, and Raymond Cavier, Villejuif, both of France, assignors to S.P.R.L. Phavic, Mouscron, Belgium

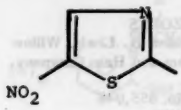
Filed Aug. 29, 1974, Ser. No. 501,579

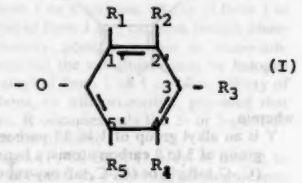
Claims priority, application United Kingdom, Aug. 29, 1973, 40626/73

Int. Cl.² C07D 277/58

U.S. Cl. 260—306.8 R **3 Claims**

1. New 2-phenoxyacetamido-5-nitro-thiazoles of the general formula:





(I)

in which at least one of the symbols R_1, R_2, R_3, R_4 and R_5 represents chlorine, bromine or fluorine or a lower alkyl containing 1 to 3 carbon atoms or trifluoromethyl radical, the remaining symbols representing hydrogen.

3,957,813

BENZOXAZOLYL PHENYL AROMATIC ESTER COMPOUNDS AND THEIR USE AS ULTRAVIOLET STABILIZERS IN ORGANIC COMPOSITIONS

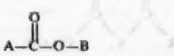
Gether Irick, Jr., and Charles A. Kelly, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 10, 1974, Ser. No. 484,848

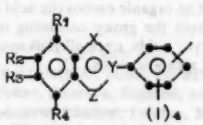
Int. Cl.² C07D 263/56

U.S. Cl. 260—307 D **16 Claims**

1. A compound of the formula:



wherein A is a group having the structure



(I)

wherein

X is a nitrogen atom, Y is a carbon atom; and

Z is an oxygen atom;

R_1, R_2, R_3 and R_4 are hydrogen, chloro, bromo, lower alkyl, I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the Y substituent and the carbon atom attached to the carboxyl group connecting the heterocyclic aromatic A group with the aromatic B group, said carbonyl connecting group is attached to the benzenoid ring in either the meta or para position from the carbon atom connected to the Y substituent; and

B is a group having the formula

wherein

at least one R_5 or R_9 is hydrogen and the other R_5, R_6, R_7, R_8 and R_9 are hydrogen, lower alkyl, hydroxy, nitrile, chloro or bromo.

3,957,814

PYRAZOL-5-ONES

Eike Möller; Karl Meng, both of Wuppertal; Egbert Wehinger, Neviges, and Harald Horstmann, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

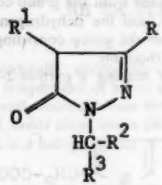
Filed Apr. 15, 1974, Ser. No. 461,282

Claims priority, application Germany, Apr. 17, 1973, 2319280; Dec. 19, 1973, 2363139

Int. Cl.² C07D *231/20, 231/38, 231/52, 401/06*

U.S. Cl. 260—310 A **28 Claims**

1. A compound of the formula



or a pharmaceutically acceptable, nontoxic salt thereof wherein

R is amino;

R^1 is hydrogen, lower alkyl or lower alkenyl;

R^2 is lower alkyl; and

R^3 is aryl of 6 to 10 carbon atoms substituted by:

a. 1 or 2 of the same or different substituents selected from the group consisting of halogen, trifluoromethyl, lower alkyl, lower alkenyl and lower alkoxy;

b. cycloalkyl of 5, 6 or 7 carbon atoms or cycloalkenyl of 5, 6 or 7 carbon atoms;

c. nitro; or

d. a substituent selected from the group consisting of trifluoromethyl and nitro, and 1 or 2 of the same or different substituents selected from the group consisting of lower alkyl, lower alkenyl, lower alkoxy, halogen and trifluoromethyl; or

R^3 is naphthyl.

3,957,815

3-[3',4'-DICHLORO-6'-ALKYL-PHENYL]-Δ²-PYRAZOLINE DERIVATIVES AND THEIR USE AS OPTICAL BRIGHTENERS

Helmut Mengler, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

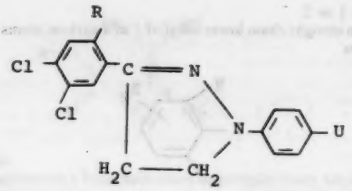
Division of Ser. No. 287,075, Sept. 7, 1972, Pat. No. 3,865,816. This application June 26, 1974, Ser. No. 483,355

Claims priority, application Germany, Sept. 9, 1971, 2145019

Int. Cl.² C07D *231/06;* **D06L** *3/12*

U.S. Cl. 260—310 D **2 Claims**

1. A compound of the formula



wherein R is methyl or ethyl and U is carboxy, carboxylic acid chloride, carbo lower alkoxy, carbodimethylamino ethoxy, carbotrimethylammoniumethoxy, carbo thiophenyl, carbonamido, or cyano.

3,957,816

SUBSTITUTED NAPHTHO PYRAZOLES

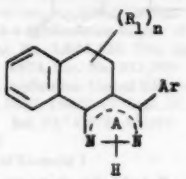
Dietmar A. Habeck, Heidelberg, Germany, and William J. Houlihan, Mountain Lakes, N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 328,402, Jan. 31, 1973, Pat. No. 3,842,088. This application June 27, 1974, Ser. No. 483,626

Int. Cl.² C07D *231/54*

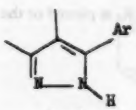
U.S. Cl. 260—310 C **3 Claims**

1. A compound of the formula

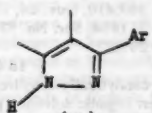


where

ring A has the structure

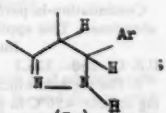


(Ia)



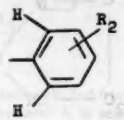
(Ib)

or



(Ic)

n is 1 or 2
R_1 is straight chain lower alkyl of 1 to 4 carbon atoms and
Ar is



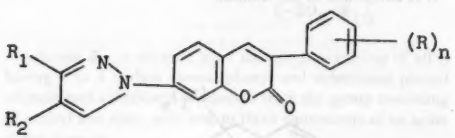
where R_2 represents hydrogen or halo having an atomic weight of about 19 to 36
or pharmaceutically acceptable acid addition salt thereof.

3,957,817
3-ARYL-7-PYRAZOLYL-COUMARINS

Alfons Dorlars, and Otto Neuner, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 5, 1969, Ser. No. 874,409
Claims priority, application Germany, Nov. 5, 1968, 1806996
Int. Cl.² C07D 311/16
U.S. Cl. 260—310 R **4 Claims**

1. A compound of the formula



in which
R is H, F. Cl, Br, alkyl of 1–4 carbon atoms or alkoxy of 1–4 carbon atoms;
n is an integer of 1 to 3;
R_1 and R_2 are independently, alkyl or cycloalkyl of up to 8 carbon atoms; alkyl of up to 8 carbon atoms substituted with phenyl, tolyl or chlorophenyl; phenyl; phenyl substituted with F, Cl, Br, alkyl of 1–4 carbon atoms or alkoxy of 1–4 carbon atoms;
with the proviso that at least one of R_1 and R_2 is phenyl or the above substituted phenyl.

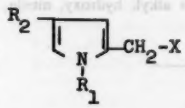
3,957,818
PREPARATION OF PYRROLE-2-ACETIC ACID DERIVATIVES

John Robert Carson, Norristown, Pa., assignor to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Continuation-in-part of Ser. No. 309,410, Nov. 24, 1972, abandoned. This application Nov. 7, 1974, Ser. No. 521,703
Int. Cl.² C07D 207/32
U.S. Cl. 260—326.2 **18 Claims**

1. The method which comprises catalytically dehydrogenating at 150°–450°C in a suitable inert organic solvent a pyrroldenemalonic acid derivative of the formula:

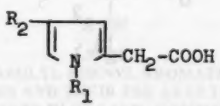
to yield the following products:



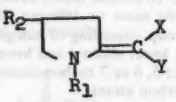
and

Wherein R_1 is a member selected from the group consisting of hydrogen and loweralkyl, R_2 is a member selected from the group consisting of hydrogen and methyl, and X and Y are each a member selected from the group consisting of COO(-loweralkyl) and CN, and the dehydrogenation catalyst is a member selected from the group consisting of metallic palladium, platinum and rhodium.

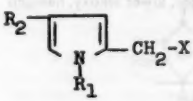
9. The process of making a pyrrole-2-acetic acid of the formula:



which comprises catalytically dehydrogenating at 150°–450°C in a suitable inert organic solvent a pyrrolidenemalonic acid derivative of the formula:



and subsequently hydrolyzing the thus-obtained dehydrogenated products of the formula:



and

to yield the aforementioned pyrrole-2-acetic acid; wherein R_1 and R_2 are each a member selected from the group consisting of hydrogen and loweralkyl, and X and Y are each a member selected from the group consisting of COO(lower-alkyl) and CN, and the dehydrogenation catalyst is a member selected

from the group consisting of metallic palladium, platinum and rhodium.

3,957,819

2-(HALO ALKYLAMINO)-3-PHENYL-3H-INDOLE-3-OLS

Alan Chapman White, Windsor, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

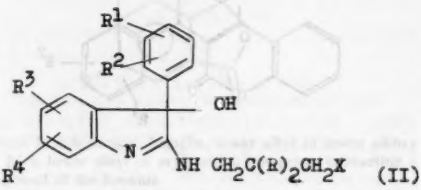
Filed Dec. 9, 1974, Ser. No. 531,019

Claims priority, application United Kingdom, Dec. 20, 1973, 59065/73

Int. Cl.² C07D *209/34*, *239/00*

U.S. Cl. 260—326.15 4 Claims

1. A compound selected from the group consisting of indole derivatives of formula (II)



(II)

and the pharmaceutically acceptable acid addition salts thereof, wherein R is hydrogen or lower alkyl, each R^1, R^2, R^3 and R^4 is independently selected from the group consisting of hydrogen, hydroxyl, lower alkyl, lower alkoxy, trifluoromethyl and halogen and X is a halogen atom.

3,957,820

PYRROLIDINES CONTAINING TWO PRIMARY AMINO GROUPS AND PROCESS FOR THEIR MANUFACTURE

Helmut Zondler, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

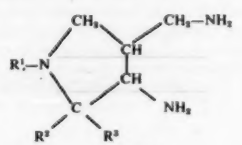
Filed July 17, 1974, Ser. No. 489,316

Claims priority, application Switzerland, July 25, 1973, 10839/73

Int. Cl.² C07D *207/14*

U.S. Cl. 260—326.85 13 Claims

1. A —3-amino-4-aminomethyl)-pyrrolidine of formula I



(I)

wherein

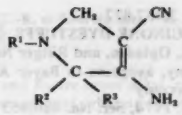
R^1 represents a branched-chain or straight-chain alkyl radical having 1 to 12 carbon atoms, a cycloaliphatic radical having 6 carbon atoms, a benzyl radical, a phenyl, p-ethyl-phenyl or p-methoxyphenyl radical or aminopropyl,

R^2 represents hydrogen, a straight-chain or branched-chain alkyl radical having 1 to 12 carbon atoms, or a phenyl radical, and

R^3 stands for hydrogen, or for an alkyl radical having 1 to 6 carbon atoms, or

R^2 and R^3 together represent a pentamethylene radical.

11. A process for the manufacture of a 3-amino-4-aminomethyl-pyrrolidine of formula I according to claim 1 characterized that a 3-amino-4-cyano-3-pyrroline of formula II



(II)

wherein

R^1 represents a branched-chain or straight-chain alkyl radical having 1 to 12 carbon atoms, a cycloaliphatic radical having 6 carbon atoms, a benzyl radical, a phenyl, p-ethylphenyl or p-methoxyphenyl radical or aminopropyl,

R^2 represents hydrogen, a straight-chain or branched-chain alkyl radical having 1 to 12 carbon atoms, or a phenyl radical, and

R^3 stands for hydrogen, or an alkyl radical having 1 to 6 carbon atoms, and

R^2 and R^3 together can also represent a pentamethylene radical,

is hydrogenated at a temperature of between about 20° and 150°C in the presence of a hydrogenation catalyst and of ammonia and under a superimposed hydrogen pressure of 1 to 300 atmospheres.

3,957,821

XANTHENYL SEMICARBAZIDES

Stewart Sanders Adams; Bernard John Armitage; Norman William Bristow, and Bernard Vincent Heathcote, all of Nottingham, England, assignors to The Boots Company Limited, England

Division of Ser. No. 277,410, Aug. 2, 1972, Pat. No. 3,842,178, which is a division of Ser. No. 858,183, Sept. 15, 1969, Pat. No. 3,686,218, which is a continuation-in-part of Ser. No. 662,587, Aug. 23, 1967, Pat. No. 3,644,420. This application July 29, 1974, Ser. No. 492,399

Claims priority, application United Kingdom, Sept. 2, 1966, 39384/66; Apr. 5, 1967, 15692/67; Sept. 27, 1968, 46085/68

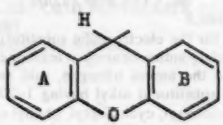
Int. Cl.² C07D *311/90*

U.S. Cl. 260—335 5 Claims

1. Compounds of formula I

I

wherein Xn represents the group



in which the rings A and B may obtionally contain 1 additional substituent selected from halogen, lower-alkyl, lower-alkoxy and hydroxy, said substituent when present being in either the 1 or 2 position of the ring;

R_1 is hydrogen, lower-alkyl or lower-alkenyl;

R_2 is hydrogen or lower-alkyl;

R_3 is hydrogen or lower-alkyl;

R_4 is hydrogen or lower-alkyl;

together with pharmaceutically acceptable acid addition salts of compounds of formula I; and, when R_3 and R_4 are each lower-alkyl, pharmaceutically acceptable quaternary salts of compounds of formula I

3,957,822

ANTHRAQUINONE DYESTUFFS

Friedrich Wilhelm Kröck, Opladen, and Rütger Neeff, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

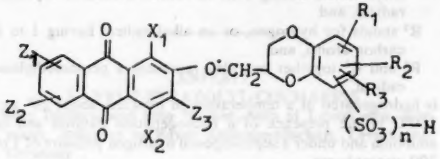
Filed June 19, 1974, Ser. No. 480,853

Claims priority, application Germany, June 19, 1973, 2331056

Int. Cl.² C07D 319/20, 319/22

U.S. Cl. 260—340.3 7 Claims

1. Anthraquinone dyestuffs, which in the form of the free acid correspond to the formula



wherein

X_1 and X_2 are hydroxyl or amino,

R_1, R_2 and R_3 are hydrogen, C_1–C_8-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylmercapto, C_1–C_4-alkylsulfonyl, C_1–C_4-alkylcarbonyl, formyl, benzoyl, nitrile, halogen, benzyl, benzyloxy or benzylsulfonyl; or two adjacent R_1, R_2 or R_3 radicals taken together form a fused cyclopentane, cyclopentene, cyclohexane, cyclohexene or benzene ring;

Z_1, Z_2 and Z_3 are hydrogen or halogen; and

n is 0 or 1.

3,957,823

ELECTROPHILIC SUBSTITUTION OF NITROSAMINES

Dieter Seebach, Lich, and Dieter Enders, Giessen, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Apr. 12, 1973, Ser. No. 350,345

Claims priority, application Germany, Apr. 15, 1972, 2218366; Sept. 22, 1972, 2246564

Int. Cl.² C07D 317/06

U.S. Cl. 260—340.5 7 Claims

1. A process for the electrophilic substitution of a nitrosamine of a secondary amine bearing at least one hydrogen atom in α-position to the amino nitrogen, said secondary amine having as its N-substituent alkyl having 1–20 carbon atoms, cyclopentyl, cyclohexyl, cycloheptyl, phenyl or benzyl, which comprises metallizing the α-hydrogen atom by reaction of said secondary amine with lithium, sodium or potassium diisopropylamide, in an inert aprotic solvent at a temperature of from room temperature down to the temperature of liquid nitrogen, and reacting the metallized nitrosamine at a temperature from room temperature down to the temperature of liquid nitrogen with an equimolecular amount of an electrophile selected from the group consisting of a saturated aliphatic aldehyde with up to twenty carbon atoms, benzaldehyde, anisaldehyde, piperonal, β-naphthaldehyde, a dialkyl ketone having up to 20 carbon atoms, cyclopentanone, cyclohexanone, cycloheptanone, cyclooctanone, acetophenone, benzophenone, acrolein, dimethylacrolein, mesityl oxide, cinnamaldehyde and 2-cyclohexen-1-one.

3,957,824

4-HYDROXYCOUMARINS

Malcolm Ronald Hadler, Tarporley, and Roy Stanley Shadbolt, Westminister Park, both of England, assignors to Ward Blenkinsop and Company Limited, England

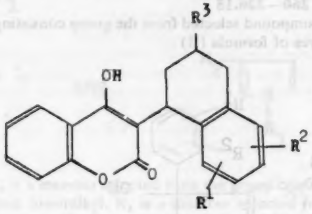
Filed May 22, 1974, Ser. No. 473,161

Claims priority, application United Kingdom, May 23, 1973, 24685/73; May 25, 1973, 25264/73; Mar. 1, 1974, 9450/74

Int. Cl.² C07D 311/56

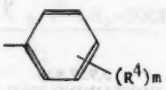
U.S. Cl. 260—343.2 R 15 Claims

1. A compound of the formula



where R^1 and R^2 are independently selected from the group consisting of hydrogen, halogen, alkyl of up to 6 carbon atoms and alkoxy of up to 6 carbon atoms, and

R^3 is an aryl group of the formula



where m is 1 or 2, and

each R^4 is independently selected from the group consisting of halogen, alkyl of 2–12 carbon atoms, alkoxy of 2–12 carbon atoms, cyclohexyl, benzyl, phenyl, halogenophenyl, phenoxy and halogenophenoxy, provided that R^3 contains not more than 3 halogen atoms.

3,957,825

PROCESS FOR SYNTHESIZING ZEARALANONE AND RELATED COMPOUNDS

Wilbert Herbert Urry, Chicago, Ill., and Guy Towns Mullenbach, Berkeley, Calif., assignors to Commercial Solvents Corporation, Terre Haute, Ind.

Division of Ser. No. 247,414, April 25, 1972, Pat. No. 3,862,982. This application Nov. 27, 1974, Ser. No. 527,843

Int. Cl.² C07D 313/00

U.S. Cl. 260—343.2 F 3 Claims

1. A method for the preparation of (R,S)-zearalanone dibenzyl ether comprising reacting 4-penten-2-yl 6-(4-pentenyl)-β-resorcylate with 2,3-dimethyl-2-butylborane to give a tertiary alkyl borane that is then reacted with carbon monoxide under super-atmospheric pressure and then with hydrogen peroxide.

3,957,826
SPIROLACTONE PRODUCTION

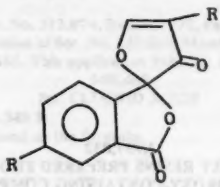
Willy Leimgruber, Montclair, and Manfred Weigele, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 447,711, March 4, 1974, Pat. No. 3,917,646, which is a division of Ser. No. 212,790, Dec. 27, 1971, Pat. No. 3,812,181. This application May 23, 1975, Ser. No. 580,389

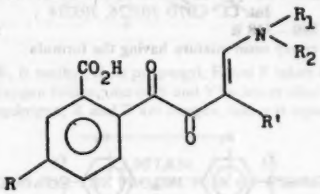
Int. Cl.² C07D *493/10*

U.S. Cl. 260—343.3 R 4 Claims

1. A process for preparing a compound of the formula



wherein R is hydrogen, halogen, lower alkyl or lower alkoxy and R′ is lower alkyl or aryl, which comprises contacting a compound of the formula



wherein R and R′ are as above and R_1 and R_2 taken independently are each lower alkyl and R_1 and R_2 taken together with the nitrogen atom form a 5- or 6-membered saturated heterocyclic ring having at the most one additional heteroatom selected from the group consisting of nitrogen and oxygen, with an aqueous medium.

3,957,827
HYDROGENATION OF CARBOXYLIC ACID ANHYDRIDES TO LACTONES OR ESTERS BY HOMOGENEOUS CATALYSIS

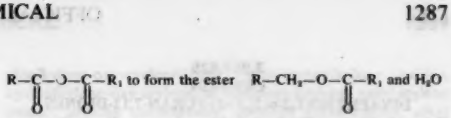
James E. Lyons, Wallingford, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Filed Oct. 17, 1974, Ser. No. 515,771

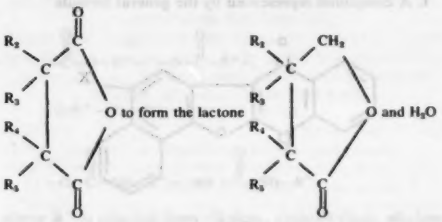
Int. Cl.² C07C *68/00*; C07D *307/20*, *307/88*

U.S. Cl. 260—343.3 R 11 Claims

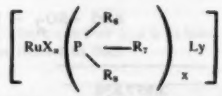
1. A process for the selective hydrogenation of acyclic and cyclic carboxylic acid anhydrides to form esters or lactones comprises reacting hydrogen with (1) an acyclic compound of the formula:



wherein R and R_1 are lower alkyl, cycloalkyl of from 5 to 15 carbon atoms, or aryl, wherein the R groups may be the same or different; or (2) a cyclic compound of the formula:



wherein R_2, R_3, R_4 and R_5 are hydrogen, lower alkyl, cycloalkyl of from 5 to 15 carbon atoms, or aryl, wherein each of the R groups may be the same or different; and wherein the R groups, taken together, may form a saturated or aromatic ring; said reaction being carried out in a homogeneous solution in the presence of a ruthenium catalyst of the formula:



wherein X is hydrogen, chlorine, bromine, iodine, or lower alkyl; *n* is an integer of from 0–2, but when *n* is 2, X may be the same or different; L is a neutral ligand, olefin, or CO; *y* is an integer of from 0–3, but when *y is* 2 or 3, L may be the same of different; R_6, R_7 and R_8 are lower alkyl, cycloalkyl of from 5 to 15 carbon atoms, aryl, benzyl, or a bidentate ligand, and each of the R groups may be the same or different; and *x* is an integer of from 1–3, at a temperature of from about 50° to 150°C., and at a hydrogen pressure of from about 40 to 400 psi.

3,957,828
3-AMINOALKYL-1,3-DIHYDRO-3-PHENYL-SPIRO[ISOBENZOFURANS]

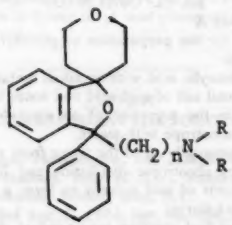
Victor J. Bauer, Somerville, and Helen H. Ong, Whippany, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed Aug. 29, 1974, Ser. No. 501,669

Int. Cl.² C07D *493/10*; A61K *31/35*

U.S. Cl. 424—283 6 Claims

1. A compound of the formula



wherein R is a linear alkyl of from 1 to 4 carbon atoms or isopropyl and *n* is the integer 2 or 3; and the physiologically acceptable acid addition salts thereof.

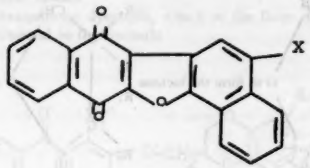
3,957,829

CERTAIN DINAPHTHO(1,2-b;2',3'-d]-FURAN-7,12-DIONES

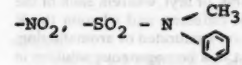
Robert J. Gruber, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 29, 1974, Ser. No. 492,555
Int. Cl.² C07D *307/92*
U.S. Cl. 260—346.2 M 4 Claims

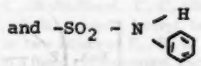
1. A compound represented by the general formula



wherein X is a member selected from the group consisting of



and



3,957,830

MANUFACTURE OF SUCCINIC ANHYDRIDE

Walter Mesch, Ruchheim, and Arnold Wittwer, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 17, 1975, Ser. No. 558,886
Int. Cl.² C07D *307/60*
U.S. Cl. 260—346.8 R 3 Claims

1. In a process for the production of succinic anhydride by dehydration of succinic acid the improvement which comprises heating succinic acid with a hydrophilic solvent selected from the group consisting of butyrolactone, valerolactone, diglycol diethyl ether, glycol diacetate, acetaldehyde butyl acetal, and glycol monobutyl ether acetate, to the boil, condensing the resulting vapors in a fractionating column, removing the water formed overhead and separating the resulting succinic anhydride from the solvent by distillation.

3,957,831

PREPARATION OF GLYCIDYL ESTERS OF UNSATURATED ACIDS

William J. Heilman, Allison Park, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 704,230, Feb. 9, 1968, abandoned. This application Jan. 27, 1970, Ser. No. 6,279
Int. Cl.² C07D *301/30*
U.S. Cl. 260—348 A 2 Claims

1. A process for the preparation of glycidyl methacrylate which comprises:

reacting methacrylic acid with an alkali metal base to form an alkali metal salt of said acid and water in a first reaction zone in the presence of an epoxide-free solvent which will azeotrope with water;

removing substantially all of the water from said first reaction zone by azeotropic distillation and from 50 to 95 weight percent of said solvent to form a first reaction zone product slurry;

contacting said first reaction zone product slurry in a second reaction zone with a solid particulate drying agent free of halogen atoms, said drying agent being such that it either reacts with water to form an hydroxide or hydrate or is a zeolite having an average pore diameter of less than six degrees Angstrom;

and thereafter reacting said slurry in the presence of said drying agent in a second reaction zone with dry epichlorohydrin under substantially anhydrous conditions to form the desired glycidyl methacrylate.

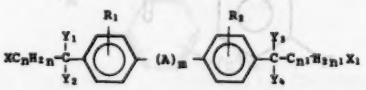
3,957,832

EPOXY RESINS PREPARED FROM POLYHYDROXY-CONTAINING COMPOUNDS

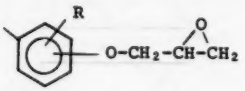
Wilbur L. Bressler, and Clyde G. Taylor, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 20,011, March 16, 1970, abandoned. This application Dec. 4, 1974, Ser. No. 529,323
Int. Cl.² C07D *303/26, 303/24*
U.S. Cl. 260—348 R 5 Claims

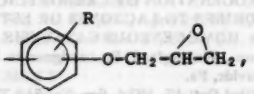
1. An epoxy resin mixture having the formula



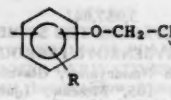
wherein R_1 and R_2 are hydrogen, A is —O—, Y_1, Y_2, Y_3, and Y_4 are independently selected from the group consisting of OH and



wherein R is hydrogen, X and X_1 are independently selected from the group consisting of hydrogen, a halogen and



m, *n* and n_1 are 1 and wherein an average of from about 3 to about 4 of the groups selected from Y_1, Y_2, Y_3, Y_4, X and X_1 are the group



3,957,833
ALKYNYLOXY-PHENYL DERIVATIVES

Madhukar Subraya Chodnekar, Basel; Albert Pfiffner, Pfaffhausen; Norbert Rigassi, Arlesheim; Ulrich Schwieter, Reinach, and Milos Suchy, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

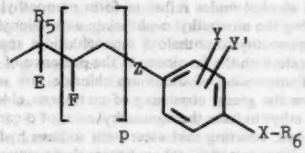
Claims priority, application Switzerland, Mar. 23, 1970, 462170

Division of Ser. No. 312,074, Dec. 4, 1972, Pat. No. 3,880,935, which is a division of Ser. No. 123,060, March 10, 1971, Pat. No. 3,718,686. This application Feb. 10, 1975, Ser. No. 548,469

Int. Cl.² C07D *303/28*

U.S. Cl. 260—348 R **2 Claims**

1. A compound of the formula:



wherein R_5 is methyl; R_6 is propargyl; E and F taken together form an oxygen bridge; one of Y and Y' is lower alkyl and the other is hydrogen; X and Z are oxygen, and *p* is equal to 1.

3,957,834
PROCESS FOR THE PRODUCTION OF ETHYLENE OXIDE

Carlo Piccinini; Morello Morelli, and Pierluigi Rebora, all of San Donato Milanese, Italy, assignors to Snam Progetti, S.p.A., San Donato Milanese, Italy

Division of Ser. No. 67,025, Aug. 26, 1970, abandoned. This application Aug. 1, 1973, Ser. No. 384,693

Claims priority, application Italy, Aug. 26, 1969, 21262/69; July 29, 1970, 28013/70; July 29, 1970, 28014/70; July 29, 1970, 28015/70

Int. Cl.² C07D *301/10*

U.S. Cl. 260—348.5 R **13 Claims**

1. A process for the production of ethylene oxide which comprises oxidizing an ethylene containing feed with oxygen in the presence of a catalyst which comprises an element or a compound of silver, calcium and barium in atomic ratios of 15:2.5:1 and at a temperature of from 100° to 400°C and at a pressure up to 35 atmospheres.

3,957,835
BROMINATED AZIDO FIRE RETARDANTS

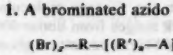
James C. W. Chien, Amherst, Mass., and Frederick George Schappell, Newark, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Jan. 15, 1975, Ser. No. 541,182

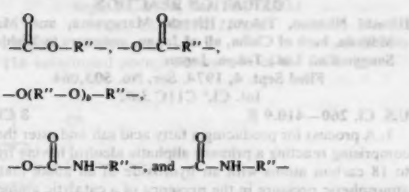
Int. Cl.² C07C *117/00*

U.S. Cl. 260—349 **9 Claims**

1. A brominated azido fire-retardant having the formula



where R is selected from alkylene, polyalkylene, cycloalkylene, alkylene cycloalkylene, arylene, alkylene arylene, poly(alkenyl arylene), alkylene-oxy-alkylene, poly(alkylene oxide), alkylene-oxy-arylene, alkylene-oxy-cycloalkylene, cycloalkylene-oxy-cycloalkylene, poly(cycloalkylene oxide), cycloalkylene-oxy-arylene, arylene-oxy-arylene, poly(arylene oxide), arylene carboalkoxy, alkylene carboaryloxy, alkyl alkylene carboxylate, aryl alkylene carboxylate, alkylene carbonyl alkylene, alkylene carbonyl arylene, cycloalkylene carbonyl cycloalkylene and arylene carbonyl arylene radicals, where the alkyl and alkylene groups contain 1 to 18 carbon atoms, R' is selected from



where R'' is selected from alkylene, cycloalkylene, alkylene cycloalkylene, arylene, alkylene arylene and the foregoing radicals with bromo substituents, where the alkylene groups contain 1 to 20 carbon atoms, and *b* is an integer from 1 to 10; A is selected from

and $—SO_2N_3$ where *z* is 0 or 1; *x* is at least 3; *n* is 0 or 1; and *y* is an integer from 1 to 100.

3,957,836
QUINONE DERIVATIVES

Hiroshi Morimoto, Hyogo; Isuke Imada, Osaka; Masazumi Watanabe, Osaka, and Mitsuru Kawada, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

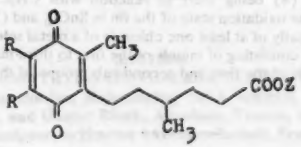
Filed June 28, 1974, Ser. No. 484,329

Claims priority, application Japan, July 2, 1973, 48-74974; Dec. 25, 1973, 49-1519

Int. Cl.² C07C *66/00, 69/95*

U.S. Cl. 260—396 R **15 Claims**

1. A compound selected from the group consisting of compounds of the formula



wherein R represents lower alkyl or lower alkoxy, or the R groups taken together form -CH=CH-CH=CH-, and Z represents hydrogen or lower alkyl, and pharmaceutically acceptable salts thereof.

3,957,837
METHIONAL-ANTIOXIDANT FOR POLYUNSATURATED OILS

Rex Junior Sims, Pleasantville, and Joseph Anthony Fioriti, Hastings-on-Hudson, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,945

Int. Cl.² C11B *5/00*

U.S. Cl. 260—398.5 **10 Claims**

1. A stabilized polyunsaturated oil composition comprising a polyunsaturated oil and from about 0.005% to about 0.5%

by weight of methional, its dimer, trimer or any combination of these based on the weight of the oil.

3,957,838

PROCESS FOR PRODUCTION OF FATTY ACID SALT AND ESTER THEREOF BY ALKALINE FUSION OXIDATION REACTION

Hiroshi Nishino, Tokyo; Hiroshi Maruyama, and Masaki Masuda, both of Chiba, all of Japan, assignors to Kishimoto Sangyo Co., Ltd., Tokyo, Japan

Filed Sept. 4, 1974, Ser. No. 503,064

Int. Cl.[2] C11C 3/02

U.S. Cl. 260—410.9 R 8 Claims

1. A process for producing a fatty acid salt and ester thereof comprising reacting a primary aliphatic alcohol having from 6 to 18 carbon atoms with an hydroxide of an alkali metal at atmospheric pressure in the presence of a catalytic amount of metallic zinc or a zinc compound by refluxing the primary aliphatic alcohol and simultaneously distilling off water and removing hydrogen gas evolved during the reaction.

3,957,839

METHOD FOR THE PREPARATION OF METHYLTIN TRICHLORIDE

Wolfgang Sundermeyer, Neckargemuend; Axel von Rumohr, Dossenheim; Willi Towae, Heidelberg, and Max Buschhoff, Luenen, all of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed Nov. 26, 1974, Ser. No. 527,482

Claims priority, application Germany, May 28, 1974, 2425770

Int. Cl.[2] C07F 7/22

U.S. Cl. 260—429.7 8 Claims

1. In a method for making methyltin trichloride by reacting methyl chloride with molten tin-(II)-chloride, the improvement wherein said reagents are reacted in an anhydrous salt melt solvent at a temperature between 250°C. and 300°C. Under an inert atmosphere, said salt melt (1) being a solvent for said tin-(II)-chloride and containing from 25 to 90 mol percent of tin-(II)-chloride dissolved therein, (2) having an initial crystallization temperature above 260°C., (3) having a boiling or sublimation temperature above the reaction temperature, (4) being inert to reaction with CH_3Cl and not altering the oxidation state of the tin in $SnCl_2$, and (5) consisting essentially of at least one chloride of a metal selected from the group consisting of metals of the first to third main groups and metals of the first and second sub-groups of the Periodic System.

3,957,840

PREPARATION OF A FERROCENYL COMPOUND

William P. Norris, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 15, 1974, Ser. No. 488,872

Int. Cl.[2] C07F 15/02

U.S. Cl. 260—439 CY 2 Claims

1. A method for preparing 4,4-diferrocenylpentanol comprising the steps of:

a. dissolving 3-acetyl-1-propanol and ferrocene in methylene chloride to form a solution;

b. adding trifluroacetic acid to the solution in an amount sufficient to provide about 10 mililiters of trifluoroacetic acid for every 10 grams of ferrocene in the solution; and

c. allowing the 3-acetyl-1-propanol and ferrocene in the solution to react under the catalytic influence of the trifluoroacetic acid.

3,957,841

PROCESS FOR PREPARING THE SODIUM SALT OF o-CARBOXYBENZOYL FERROCENE

Alexandr Nikolaevich Nesmeyanov, Glavnoe zdanie MGU, korpus "K", kv. 105, Moscow; Ljubov Grigorievna Bogomolova, ulitsa Nekrasova, 60, kv. 131, Leningrad; Nadezhda Sergeevna Kochetkova, ulitsa Garibaldi, 23/56, korpus 4, kv. 27, Moscow; Vera Dmitrievna Vilchevskaya, ulitsa Dmitria Ulyanova, 4, korpus 2, kv. 47, Moscow; Nikanor Petrovich Palitsyn, ulitsa Stankevicha, 12, kv. 10, Moscow; Julia Julievna Gorelikova, Nagatinskaya ulitsa, 58, korpus 2, kv. 73, Moscow; Irina Gennadievna Andrianova, prospket Smirnova, 43, kv. 27, Leningrad; Olga Petrovna Belozerova, prospekt Mira, 124, korpus 15, kv. 72, and Vera Khusainovna Sjundjukova, ulitsa Vavilova, 44/2, kv. 154, both of Moscow, all of U.S.S.R.

Division of Ser. No. 423,533, Dec. 10, 1973, abandoned, which is a continuation of Ser. No. 119,356, Feb. 26, 1971, abandoned. This application Aug. 14, 1974, Ser. No. 497,501

Int. Cl.[2] C07F 15/02

U.S. Cl. 260—439 CY 3 Claims

1. A process for preparing the sodium salt of o-carboxybenzoylferrocene which comprises reacting phthalic anhydride with ethyl alcohol under reflux to form monoethyl o-phthalate, reacting the monoethyl o-phthalate with thionyl chloride to form monoethyl o-phthaloyl monochloride, reacting the monochloride with the ferrocene in the presence of a catalyst which is a suspension of aluminum chloride in a solvent selected from the group consisting of methylene chloride and di-n-butyl ether to form the monoethyl ester of o-carboxybenzoylferrocene, reacting said ester with sodium hydroxide to form the sodium salt of o-carboxybenzoylferrocene and isolating said salt.

3,957,842

ORGANOSILICONE POLYMERS

Bela Prokai, Mahopac, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 212,729, Dec. 27, 1971, Pat. No. 3,836,560, which is a continuation-in-part of Ser. No. 122,164, March 8, 1971, abandoned. This application July 27, 1974, Ser. No. 483,661

Int. Cl.[2] C07F 7/08, 7/10, 7/18

U.S. Cl. 260—448.2 B 10 Claims

1. A high molecular weight linear non-hydrolyzable siloxane-polyoxyalkylene block copolymer having the average formula

$$\left(\left[Y(R_2SiO)_aR_2SiYO(C_nH_{2n}O)_y\right]\right)_d$$

wherein R represents a monovalent hydrocarbon radical free from aliphatic unsaturation; n is an integer of from 2 to 4 inclusive; a is an integer of at least 6; y is an integer of at least 4; d is an integer of at least 4; Y represents a divalent organic group selected from the class consisting of —R'—, —R'CO— —R'NHCO—, —R'—NHCONH—R''—NHCO— and —R'—OOCNH—R''—NHCO— wherein R' is a divalent alkylene radical and R'' is R' or a divalent arylene group; wherein the average molecular weight of each siloxane block ranges from about 500 to about 10,000; wherein the average molecular weight of each polyoxyalkylene block ranges from about 300 to about 10,000; wherein the siloxane blocks constitute about 20 to about 50 weight percent of the copolymer; wherein the polyoxyalkylene blocks constitute about 80 to about 50 weight percent of the copolymer; and wherein the block copolymer has an average molecular weight of at least about 30,000.

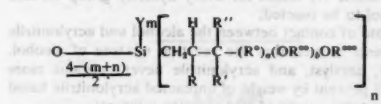
3,957,843
NON-ISOMERIZABLE OLEFINIC POLYOXYALKYLENE POLYMERS AND SILOXANE-POLYOXYALKYLENE COPOLYMER DERIVATIVES THEREOF

Everett W. Bennett, Longmeadow, Mass., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 30, 1971, Ser. No. 129,562
Int. Cl.² C07F 7/08
U.S. Cl. 260—448.2 B 11 Claims

1. A siloxane-polyoxyalkylene block copolymer consisting essentially of:

a. at least one unit having the formula:



wherein

Y is a monovalent hydrocarbon group free of aliphatic carbon to carbon multiple bonds, *m* has a value from 0 to 2 inclusive, *n* has a value from 1 to 3 inclusive, (*m*+*n*) has a value from 1 to 3 inclusive, R is hydrogen or a monovalent hydrocarbon group free of aliphatic carbon to carbon multiple bonds, R′ and R″ are each monovalent hydrocarbon groups free of aliphatic carbon to carbon multiple bonds, R° is a divalent hydrocarbon group free of aliphatic carbon to carbon multiple bonds, a has a value of 0 to 1, R°° is a alkylene group containing at least two carbon atoms, *b* has a value of at least 5 and R°°° is —R, —OCNHR, —OCR′ or —OCOR′ (where R and R′ are as defined above); and

b. units having the formula:

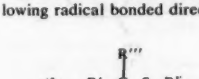
wherein *p* has a value from 1 to 3 inclusive and Z is a monovalent hydrocarbon group free of aliphatic carbon to carbon multiple bonds.

3,957,844
PROCESS FOR MAKING MERCAPTO SUBSTITUTED SILICON COMPOUNDS

Jeffrey Y. P. Mui, Ossining, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 280,232, Aug. 14, 1972, abandoned. This application May 22, 1974, Ser. No. 472,174
Int. Cl.² C07F 7/18, 7/08
U.S. Cl. 260—448.2 E 10 Claims

1. The process of forming mercaptoalkylsilicon compounds which comprises reacting at a temperature of about 100°C. to about 300°C. a silicon containing compound having the following radical bonded directly to a silicon atom thereof:



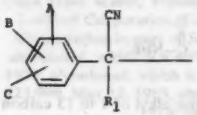
wherein R′ and R″ are monovalent hydrocarbon radicals, R‴ is hydrogen or a monovalent hydrocarbon radical, R^{r} is a divalent hydrocarbon radical in which the carbon atom thereof bonded to sulfur is methylene; in the presence of an acidic Friedel-Crafts or transistion metal halide catalyst, whereby to form a silicon compound having the radical HSR^{r}— bonded directly to such silicon atom thereof.

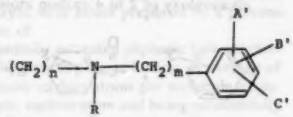
3,957,845
TRIFLUOROMETHYL-SUBSTITUTED PHENYL ACETONITRILES

Hans-Jorg Treiber, Bruhl, and Ferdinand Dengel, Wilhelmsfeld, both of Germany, assignors to Knoll A.G. Chemische Fabriken, Ludwigshafen (Rhine), Germany

Continuation-in-part of Ser. No. 555,955, June 8, 1966, abandoned, which is a continuation-in-part of Ser. No. 190,772, April 27, 1962, Pat. No. 3,261,859. This application Sept. 14, 1970, Ser. No. 72,131
Int. Cl.² C07C 121/78
U.S. Cl. 260—465 E 9 Claims

1. The substituted phenyl-acetonitrile of the formula





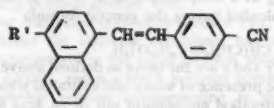
wherein R is methyl, *m* is 2, as is 3 and when one of the substituents A, B and C is trifluoro methyl, the other two substituents are each hydrogen, when two of the substituents are methoxy, the other substituent is hydrogen, or all three substituents are methoxy, and when one of A′, B′ and C′ is trifluoromethyl the other two substituents are each hydrogen, and when two of the substituents are methoxy, the other substituent is hydrogen, or all three substituents are hydrogen; and R_1 is isopropyl or trifluoro methylbenzyl with the proviso that at least one of A, B, C, A′, B′, or C′ be a trifluoro methyl substituent in a position other than in the ortho-position on the ring, and the pharmaceutically acceptable acid addition salts.

3,957,846
MONOSTYRYL-NAPHTHALENE DERIVATIVES

Ulrich Pintschovius, Hattersheim; Erich Schinzel, Hofheim, Taunus, and Günter Rösch, Altenhain, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 206,175, Dec. 8, 1971, Pat. No. 3,822,305. This application Mar. 22, 1974, Ser. No. 453,848
Claims priority, application Germany, Dec. 8, 1970, 2060228
Int. Cl.² C07C 121/64
U.S. Cl. 260—465 D 3 Claims

1. A compound of the formula



wherein R′ is carboxy, lower carboalkoxy or lower carboalkoxy substituted by lower dialkylamino or lower trialkylammonium.

3,957,847
2-CYANO-2-HYDROXYIMINOACETAMIDES AS PLANT DISEASE CONTROL AGENTS

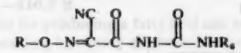
Sidney Hayes Davidson, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 453,392, March 21, 1974, which is a continuation-in-part of Ser. No. 375,376, July 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 330,457, Feb. 7, 1973, abandoned, which is a continuation-in-part of Ser. No. 234,997, March 15, 1972, abandoned. This application Mar. 10, 1975, Ser. No. 557,035

Int. Cl.[2] C07C *121/417, 121/46, 121/60*

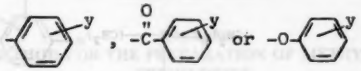
U.S. Cl. 260—465.4 **9 Claims**

1. A compound of the formula

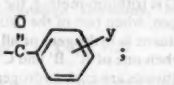


wherein

R is alkyl of 1 to 13 carbon atoms; alkyl of 1 to 13 carbon atoms substituted with alkoxycarbonyl of 2 to 4 carbon atoms, alkanoyl of 2 to 4 carbon atoms, hydroxyl, cyano, alkanoyloxy of 2 to 4 carbon atoms,



alkenyl of 3 to 6 carbon atoms; cycloalkyl of 5 to 7 carbon atoms; O,O-dialkyl thiophosphoryl of 2 to 4 carbon atoms; alkanoyl of 1 to 4 carbon atoms or



Y is hydrogen, chlorine, fluorine, bromine, methyl or cyano; and

R_6 is hydrogen, alkyl of 1 to 4 carbon atoms or allyl provided that the total number of carbon atoms in the substituent R is less than 14.

3,957,848
CYANOETHYLATION PROCESS

James D. Reedy, Williamstown, and Paul H. Paugh, Sisterville, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 11, 1975, Ser. No. 557,246

Int. Cl.[2] C07C *120/00, 121/38, 121/30*

U.S. Cl. 260—465.6 **5 Claims**

1. A cyanoethylation process for preparing betacyanoethyl capped hydroxy compounds that are essentially free of polyacrylonitrile by-products, said compounds having the general formula

$$H_2C=CH(CH_2)_yO(C_nH_{2n}O)_xCH_2CH_2CN$$

wherein y has a value of 0 to 4 inclusive, n has a value of 2 to 4 inclusive and *x* has a value of 1 to 20; said process comprising reacting at a temperature of 0° to 80°C. an unsaturated polyether alcohol having the general formula

$$H_2C=CH(CH_2)_yO(C_nH_{2n}O)_xH$$

wherein *n*, *y* and *x* are the same as defined above, with acrylonitrile in the presence of water and a catalyst which is an alkali metal or tetraalkyl ammonium salt of an acid selected from the class consisting of partial phosphate esters, alkyl mercaptans, cresols and partial pyrophosphate esters, by (A) slowly adding said acrylonitrile to a mixture containing said alcohol, water and catalyst, (B) neutralizing said catalyst and recovering the beta-cyanoethyl capped hydroxy compound product; wherein;

a. said catalyst is soluble in said mixture of alcohol, water and catalyst ingredients;

b. said acid has an aqueous pKa value of greater than 10 but less than 15;

c. the amount of catalyst employed is such that the aqueous pH of a separate mixture containing about 10 percent by weight of a sample of said mixture of alcohol, water and catalyst ingredients and about 90 percent by weight of additional water ranges from 9 to about 10.7;

d. the amount of acrylonitrile employed ranges from about 1 to about 1.1 moles for every hydroxy group on said alcohol to be reacted;

e. the rate of contact between the alcohol and acrylonitrile reactants is such that the reaction mixture of alcohol, water, catalyst, and acrylonitrile never contains more than 5 percent by weight of unreacted acrylonitrile based on the total weight of said reaction mixture;

f. the amount of water employed ranges from about 0.1 to about 0.5 percent by weight based on the amount of said alcohol employed.

3,957,849
CYCLOPROPANE ESTERS

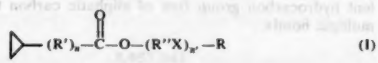
Clive A. Henrick, and Gerardus B. Staal, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Sept. 9, 1974, Ser. No. 504,224

Int. Cl.[2] C07G *69/74*

U.S. Cl. 260—468 H **21 Claims**

1. Compounds selected from those of formula I



(I)

wherein,

R is alkyl of one to eighteen carbon atoms, alkenyl of two to eighteen carbon atoms, alkynyl of two to eighteen carbon atoms, cycloalkyl of four to eight carbon atoms, aryl of six to fourteen carbon atoms, or aralkyl of seven to fifteen carbon atoms, each of said cycloalkyl, aryl, or aralkyl ring being optionally substituted by one or two alkyl of one to eighteen carbon atoms, alkoxy of one to fifteen carbon atoms, halogen or nitro groups;

R' is —CH=CH— or $-(CH_2)_p-$ in which p in an even integer from two to twenty;

R'' is ethylene or propylene; X is oxygen or sulfur;

n is zero or one; and

n' is one, two or three, with the proviso that each compound contains at last twelve carbon atoms in the molecule.

3,957,850
PHENYLACETIC ACID DERIVATIVES

Emile Bouchara, 75 bis, Avenue Foch, 75 Paris, France

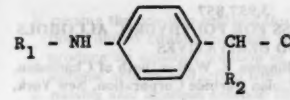
Filed May 9, 1972, Ser. No. 251,680

Claims priority, application France, May 17, 1971, 71.17714

Int. Cl.[2] C07F *101/44*

U.S. Cl. 260—471 R **19 Claims**

1. Compounds selected from the group consisting of phenylacetic acid derivatives having the general formula



(I)

in which R_1 is selected from the group consisting of ethyl, n-propyl, isopropyl, n-butyl. benzyl, allyl, methallyl and propargyl and R_2 is selected from the group consisting of hydrogen and methyl, the methyl and ethyl esters thereof and their pharmaceutically acceptable salts.

3,957,851

1-PHENYL-4-AMINO-CYCLOHEX-2-ENE-1-CARBOXYLIC ACID ETHYL ESTERS

Gerhard Satzinger, and Manfred Franz Herrmann, both of Gundelfingen, Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Feb. 15, 1972, Ser. No. 226,509

Claims priority, application Germany, Feb. 18, 1971, 2107871

The portion of the term of this patent subsequent to Sept. 16, 1992, has been disclaimed.

Int. Cl.² C07C *101/38*

U.S. Cl. 260—471 A **9 Claims**

1. 1-Phenyl-4-dimethylamino-cyclohex-2-ene-1-carboxylic-acid-ethylester.

3,957,852

DIPHENYL ETHER COMPOUNDS

Kanichi Fujikawa, Kyoto; Isao Yokomichi; Nobuyuki Sakashita, both of Kusatsu; Kazuyuki Maeda, Hikone, and Takahiro Haga, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

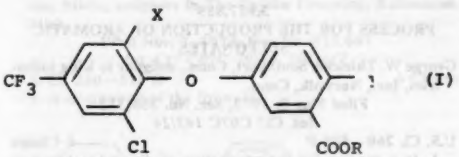
Filed Dec. 27, 1974, Ser. No. 537,003

Claims priority, application Japan, Dec. 27, 1973, 49-1466

Int. Cl.² C07B *69/88*

U.S. Cl. 260—473 R **13 Claims**

1. A compound of the general formula (I)



(I)

wherein X is a hydrogen atom or a chlorine atom; Y is a halogen atom; and R is a hydrogen atom, an alkyl group containing 1 to 5 carbon atoms, or a cation.

3,957,853

METFORMINE SALT OF ACETYLSALICYLIC ACID

Odile Bohuon, Paris, France, assignor to Societe d'Etudes et d'Exploitation de Marques et Brevets S.E.M.S., France

Filed Sept. 11, 1974, Ser. No. 505,015

Claims priority, application France, Sept. 19, 1973, 73.33647

Int. Cl.² C07C *87/20*

U.S. Cl. 260—480 **1 Claim**

1. Metformine mono acetylsalicylate.

3,957,854

ESTER-CONTAINING COMPOSITIONS

Clark Ober Miller, Willoughby Hills, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 152,425, June 11, 1971, abandoned, which is a division of Ser. No. 12,838, Feb. 19, 1970, abandoned, which is a continuation-in-part of Ser. No. 823,990, May 12, 1969, abandoned. This application Sept. 17, 1973, Ser. No. 398,034

Int. Cl.² C07C *103/14*

U.S. Cl. 260—482 R **15 Claims**

1. Oil-soluble carboxylic acid esters prepared by a process comprising the reaction of

A. at least one substantially saturated aliphatic hydrocarbon polycarboxylic acid acylating agent having an average of at least thirty aliphatic carbon atoms per molecule exclusive of the carboxylic carbon atom and being substantially free from oil-solubilizing pendant groups; with

B. at least one polyoxyalkylene alcohol which is a demulsifier for aqueous emulsion, has an average molecule weight in the range of from about 1,000 to about 10,000, and is a block polymer comprising (1) a hydrophobic portion corresponding to the formula, —CH(R')-CH_2-O—, wherein R' is an alkyl group of up to three carbon atoms, and (2) from about 5% to about 40% by weight of a hydrophilic portion corresponding to the formula, —CH_2-CH_2-O—; and

C. at least one primary or secondary amine; wherein the total amount of (A), (B) and (C) used in the reaction is such that there is at least 0.001 equivalent of (B), and at least 0.01 equivalent of (C) per equivalent of (A).

3,957,855

ESTER-CONTAINING COMPOSITIONS

Clark Ober Miller, Willoughby Hills, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 152,425, June 11, 1971, abandoned, Division of Ser. No. 12,838, Feb. 19, 1970, abandoned, which is a continuation-in-part of Ser. No. 823,990, May 12, 1969, abandoned. This application Sept. 17, 1973, Ser. No. 398,910

Int. Cl.² C07C *103/14*

U.S. Cl. 260—482 R **16 Claims**

1. Oil-soluble carboxylic acid esters prepared by a process comprising the steps of

I. the esterification of at least one substantially saturated aliphatic hydrocarbon polycarboxylic acid acylating agent (A) having an average of at least thirty aliphatic carbon atoms per molecule exclusive of the carboxylic carbon atoms, and being substantially free from oil-solubilizing pendant groups; with

1. at least one polyoxyalkylene alcohol (B), which is a demulsifier for aqueous emulsions, has an average molecular weight in the range of from about 1,000 to about 10,000, and is a block polymer comprising (i) a hydrophobic portion corresponding to the formula -CH(R')-CH_2-O-, wherein R' is an alkyl group of up to three carbons, and (ii) from about 5% to about 40% by weight of a hydrophilic portion corresponding to the formula, -CH_2-CH_2-O-; and

2. at least one polyhydric alcohol (C) having two to ten hydroxyl groups and up to twenty aliphatic carbon atoms;

wherein the amount of (B) and (C) used in the reaction is such that there is at least 0.001 equivalent of (B), and at least 0.2 equivalent of (C) per equivalent of (A), and total amount of (B) and (C) is at least about 0.5 equivalent, whereby a first esterified product is formed; and

II. reacting the esterified product of step (I); with

3. at least one primary or secondary amine (D);

wherein the amount of (D) used in the reaction is such that there is at least about one equivalent of (D) for each unreacted equivalent of (A), whereby the second esterified product is formed.

3,957,856
PRODUCTION OF THE CARBOXYLIC ACID OF PERILLYL ALCOHOL

Hifzur R. Ansari, Rayleigh, and Paul E. Fido, London, both of England, assignors to Bush Boake Allen Limited, London, England

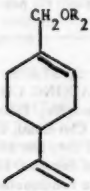
Filed Mar. 24, 1975, Ser. No. 561,320

Claims priority, application United Kingdom, Apr. 1, 1974, 14367/74

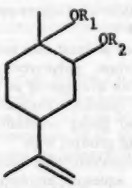
Int. Cl.² C07C *67/28*

U.S. Cl. 260—489 **10 Claims**

1. A process for the preparation of compounds of the formula



which comprises pyrolysing a compound of the formula



wherein R_1 and R_2 represent the same or different groups selected from the group consisting of acetyl, propionyl, n-butanoyl and iso-butanoyl; in the liquid phase at a temperature of from 200°C to 260°C for a period of greater than four hours.

3,957,857
CATALYTIC PROCESS FOR POLYHYDRIC ALCOHOLS AND DERIVATIVES

Roy L. Pruett, and Wellington E. Walker, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 371,350, June 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 219,130, Jan. 19, 1972, Pat. No. 3,833,634, which is a continuation-in-part of Ser. No. 210,538, Dec. 21, 1971, abandoned. This application Apr. 18, 1974, Ser. No. 462,109

Int. Cl.² C07C *27/06*

U.S. Cl. 260—449 **17 Claims**

1. The process of making an alkane polyol(s) which comprises reacting a mixture consisting essentially of oxides of carbon and hydrogen in the presence of a rhodium carbonyl complex provided to the reaction as a rhodium carbonyl cluster which possesses an infrared spectrum which exhibits three intense wavelength bands between about plus and minus 10 cm^{-1} of about 1868 cm^{-1}, about 1838 cm^{-1}, and about 1785 cm^{-1} at a pressure between at least about 500 to about 50,000 pounds per square inch absolute and at a temperature of between about 100°C. and about 375°C. sufficient to form such alkane polyol.

3,957,858
SUBSTITUTED ETHANE DIPHOSPHONIC ACIDS AND SALTS AND ESTERS THEREOF

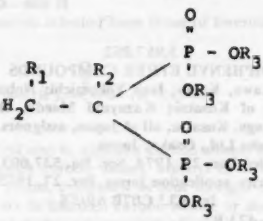
Al F. Kerst, Littleton, Colo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 27,988, April 13, 1970, Pat. No. 3,705,191. This application Aug. 23, 1972, Ser. No. 283,146

Int. Cl.² C07F *9/39, 9/29*

U.S. Cl. 260—502.4 P **8 Claims**

1. An ethane diphosphonate of the formula



wherein each R_3 is individually selected from the group consisting of hydrogen, alkali metal ions, alkaline earth metal ions, ammonium ions and lower alkyl amine ions and R_1 and R_2 are either hydroxy or a $—OR_5$ or $—SR_5$ group where R_5 is C_{1-8} alkyl, phenyl, or benzyl, provided that R_1 or R_2 but not both is always hydroxy.

3,957,859
PROCESS FOR THE PRODUCTION OF AROMATIC SULFONATES

George W. Thielcke, Southport, Conn., assignor to King Industries, Inc., Norwalk, Conn.

Filed May 8, 1973, Ser. No. 358,312

Int. Cl.² C07C *143/24*

U.S. Cl. 260—505 P **6 Claims**

1. In a process for the production of dinonylnaphthalene monosulfonic acid and dinonylnaphthalene disulfonic acid by agitating a mixture of dinonylnaphthalene, sulfuric acid and a solvent, said monosulfonic acid being preferentially soluble in a solvent selected from the group consisting of naphtha, hexane, heptane and octane and said disulfonic acid being preferentially soluble in water and more soluble in a higher alkanol containing from about 5 to about 12 carbon atoms than in water, the improvement which comprises:

a. carrying out the reaction in a solvent selected from the group consisting of naphtha, hexane, heptane and octane;

b. passing the reaction solution through a multi-stage reaction column countercurrently to a stream of water to produce an aqueous solution of dinonylnaphthalene disulfonic acid by extraction from the reaction solution;

c. passing said aqueous solution through a multi-stage extraction column countercurrently to a stream of a higher alkanol containing from about 5 to about 12 carbon atoms to produce a solution of dinonylnaphthalene disulfonic acid in the higher alkanol by extraction from said aqueous solution; and

d. recovering dinonylnaphthalene disulfonic acid from said alkanol solution.

3,957,860
PROCESS FOR THE MANUFACTURE OF NUCLEAR-SULPHONATED COMPOUNDS

John Lenoir, Marly, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

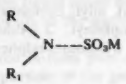
Continuation-in-part of Ser. No. 340,641, March 12, 1973, abandoned. This application June 17, 1974, Ser. No. 480,082

Claims priority, application Switzerland, Mar. 16, 1972, 3939/72

Int. Cl.² C07C *143/56, 143/64, 149/40*

U.S. Cl. 260—508 **16 Claims**

1. Process for the manufacture of nuclear-sulfonated aromatic compounds which comprises reacting (1) at most tricyclic homocyclic aromatic amino compounds with 1 or 2 amino groups directly bonded to the aromatic ring system and which compounds contain as further substituents halogen, alkyl, halogenoalkyi, alkoxyalkyl, carboxyalkyl, alkoxy, alkoxyalkoxy, carboxyl, alkoxycarbonyl, carbamoyl, nitrile, nitro, alkylsulphonyl, phenylsulphonyl, sulpho, sulphamoyl, alkylmercapto, phenylmercapto or phenoxy where alkyl contains 1 to 8 carbon atoms with (2) a sulfonating agent of the formula



wherein M is hydrogen, the ammonium cation or an ammonium ion of the formula R R_1 NH_2—$^+$, R is hydrogen, alkyl with 1 to 8 carbon atoms or cycloalkyl with 5 or 6 carbon atoms, and R_1 is hydrogen or alkyl with 1 to 8 carbon atoms in the presence of (3) a catalyst which is N-methyl-pyrrolid-2-one, Σ-caprolactam, or N-methyl-piperid-2-one in an aprotic solvent at temperatures between 20° and 250°C.

3,957,861
BIPHENYLYLPROPIONIC ACIDS AND ESTERS

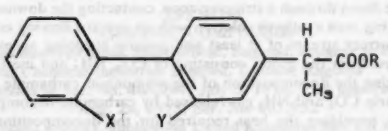
Milton E. Herr, Deltona, Fla., and Roy A. Johnson, Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 7, 1973, Ser. No. 413,647

Int. Cl.² C07C *79/46, 101/447*

U.S. Cl. 260—515 R **5 Claims**

1. A compound of the formula



wherein X is selected from the group consisting of nitro and amino with the proviso that when Y is hydrogen, X is nitro; Y is selected from the group consisting of hydrogen and fluoro; R is selected from the group consisting of hydrogen and alkyl of from one to six carbon atoms, inclusive.

3,957,862
METHOD OF MAKING AROMATIC BIS(ETHER ORTHO PHTHALIC ACID)S

Darrell R. Heath, Pittsfield, Mass., and Tohru Takekoshi, Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 346,473, March 30, 1973, Pat. No. 3,879,428. This application Dec. 6, 1974, Ser. No. 530,184

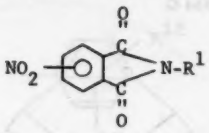
The portion of the term of this patent subsequent to Apr. 22, 1992, has been disclaimed.

Int. Cl.² C07D *307/89*

U.S. Cl. 260—520 E **9 Claims**

1. A method for making an aromatic-bis(ether dicarboxylic acid) which comprises

a. effecting the nitro displacement of a nitrophthalimide of the formula,



with an alkali diphenoxide of the formula,

M—O—R—O—M

to produce an intermediate aromatic-bis(etherphthalimide), (b) hydrolizing the aromatic-bis(etherphthalimide) of (a) with base to produce a tetra-carboxylic-acid-salt and (c) acidifying the tetra-carboxylic-acid salt to produce the corresponding tetra-carboxylic-acid, where R is a divalent aromatic radical having from 6–30 carbon atoms, M is an alkali metal ion, and R^1 is a monovalent organo radical selected from the class consisting of aromatic hydrocarbon radicals, halogenated aromatic hydrocarbon radicals and altyl radicals of 1—8 carbon atoms.

3,957,863
ANTI-MICROBIALLY ACTIVE SURFACE-ACTIVE AGENTS

Helmut Diery, Paris, France; Elmar Schrinner, Wiesbaden, Germany; Kurd Gunther, Diedenbergen, Taunus, Germany, and Gerhart Schneider, Schneidhain, Taunus, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

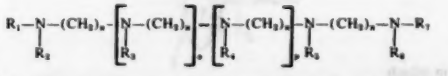
Filed Nov. 12, 1974, Ser. No. 523,021

Claims priority, application Germany, Nov. 16, 1973, 2357278

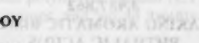
Int. Cl.² C07C *101/24, 101/26*

U.S. Cl. 260—534 R **6 Claims**

1. A compound of the general formula



in which one or two of the radicals R_i (i = 1 to 7) stands for a linear or branched alkyl or alkenyl radical of 8 to 18 carbon atoms, one or two of the radicals R_m (m = 2 to 6, m being i) stands for the radical of the formula



and the other radicals R_k (k = 1 to 7, k being i, m) stand for hydrogen or methyl, Y stands for hydrogen or an alkali metal ion, n is 2 or 3 and o and p are 0 or 1.

3,957,864

PROCESS FOR RECOVERY OF 1-GLUTAMIC ACID

John S. Gallagher, Paris, Ill., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Filed Mar. 31, 1975, Ser. No. 563,755
Int. Cl.² C07C 99/12
U.S. Cl. 260—534 G 1 Claim

1. An improved method for recovering 1-glutamic acid from a solution containing it by the steps of adjusting the pH of an aqueous solution containing glutamic acid to about 4.5 while maintaining ambient temperature, holding the solution with agitation until crystals begin to appear, heating to within 47° to 55°, adjusting the pH to about 3.2, cooling to about 20°C thereby causing the 1-glutamic acid to crystallize in a changed crystal form, and recovering same by centrifugation, filtration or decantation.

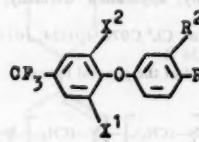
3,957,865

HALOGENATED 4-TRIFLUOROMETHYL-DIPHENYL-ETHER COMPOUNDS

Lothar Rohe, Wuppertal; Jurgen Schramm, Dormagen; Erich Klauke, Odenthal-Hahnenberg; Ludwig Eue, and Robert Rudolf Schmidt, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 26, 1974, Ser. No. 483,331
Claims priority, application Germany, July 3, 1973, 2333848
Int. Cl.² C07C 125/00, 145/00, 153/00
U.S. Cl. 260—551 R 8 Claims

1. Halogenated 4-trifluoromethyl-diphenyl-ether compound of the formula



(I)

in which

R^1 is aminothiocarbonyl;

R^2 is hydrogen or methyl;

X^1 is halogen; and

X^2 is hydrogen or halogen.

3,957,866

CYCLOPENTYL CARBAMIDE DERIVATIVE AND PROCESS FOR ITS PRODUCTION

Antonio Camelo Marin Moga, Barcelona, Spain, assignor to J. Uriach & Cia S.A., Barcelona, Spain

Continuation-in-part of Ser. No. 182,187, Sept. 20, 1971, abandoned. This application May 2, 1974, Ser. No. 466,412
Claims priority, application Spain, Sept. 23, 1970, 384463
Int. Cl.² C07C 127/16
U.S. Cl. 260—553 DA 2 Claims

1. N-[4-beta-(o-anisamide-ethyl)-benzenesulphonyl]-N'-cyclopentylcarbamide or a salt thereof of a pharmaceutically acceptable acid.

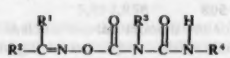
3,957,867

CERTAIN OXIMINYL ALLOPHANATES AND THEIR USE AS HERBICIDES

Peter Anthony Bukowick, New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 11, 1973, Ser. No. 350,218
Int. Cl.² C07C 127/15, 127/19, 127/22
U.S. Cl. 260—553 A 4 Claims

1. A compound having the following structural formula:



in which when R^1 and R^2 are taken separately, R^1 is selected independently from the group consisting of hydrogen and C_1–C_7 alkyl and R^2 is selected independently from the group consisting of C_1–C_7 alkyl and phenyl, and, when taken together with the carbon atom to which they are attached R^1 and R^2 form a C_3–C_8 cycloalkyl group; R^3 is selected from the group consisting of C_1–C_7 alkyl, allyl, phenyl, 3-halophenyl and 3,4-dihalophenyl; and R^4 is selected from the group consisting of C_1–C_7 alkyl, allyl, cyclohexyl, phenyl, halophenyl, tolyl, anisolyl, nitrophenyl, 3,4-dihalophenyl, 1-naphthyl, p-toluene sulfonyl, trihalomethylphenyl and 2,6-dinitro-4-trihalomethylphenyl.

3,957,868

PROCESS FOR PREPARING UREA FROM AMMONIA AND CARBON DIOXIDE

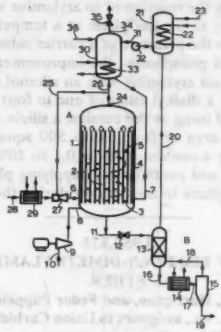
Johannes D. M. Verstegen, and Petrus J. C. Kaasenbrood, both of Sittard, Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed May 16, 1974, Ser. No. 470,663
Claims priority, application Netherlands, May 21, 1973, 7307036
Int. Cl.² C07C 126/00
U.S. Cl. 260—555 A 6 Claims

1. In a process for synthesizing urea from the reaction of ammonia with gaseous carbon dioxide under a pressure in the range of 100–300 atmospheres and at a temperature of 140° to 200°C to form a urea synthesis solution which contains urea, water and ammonium carbamate in a urea synthesis reaction zone and thereafter decomposing the ammonium carbamate in a decomposing and stripping zone, including flowing the urea synthesis solution from the synthesis reaction zone down through a stripping zone, contacting the downward flowing urea synthesis solution with an upward flowing countercurrent stream of at least one gaseous stripping agent selected from the group consisting of CO_2, NH_3 and inert gas causing the decomposition of the ammonium carbamate and to strip CO_2 and NH_3 gas released by carbamate decomposition, providing the heat required for the decomposition of ammonium carbamate contained in the urea synthesis solution and for the expelling of gaseous ammonia and carbon dioxide from said solution by transferring most of the heat evolved in the synthesis reaction zon to the urea synthesis solution flowing down through said stripping zone, through a wall separating the urea synthesis reaction zone and the stripping zone,

thereby controlling the temperature in the synthesis reaction zone, the decomposition and stripping zone maintained at essentially the same pressure as the synthesis reaction zone, and recycling at least portion of the gas mixture from said decomposing and stripping operation into said urea synthesis reaction zone; the improvement comprising

a. maintaining the temperature in the synthesis reaction zone in the range of from about 210° to about 245°C;



b. maintaining the synthesis reaction zone at a pressure of about 250 to 600 atmospheres;

c. conducting the synthesis reaction with a gross molar NH_3/CO_2 ratio in the liquid phase between about 2.5 and about 8 so that not all of the gaseous carbon dioxide is reacted; and

d. introducing into the bottom part of the urea synthesis reaction zone the portion of the gas mixture to be recycled.

3,957,869

N-(CHLOROALKOXYMETHYL)ACRYLAMIDES, QUATERNARY AMMONIUM DERIVATIVES THEREOF, AND POLYMERS HAVING A CONTENT THEREOF

Daniel Elmer Nagy, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed June 14, 1974, Ser. No. 479,337

Int. Cl.² C07C *103/10*

U.S. Cl. 260—561 N **19 Claims**

1. A N-)chloro C_2–C_8 alkoxymethyl)acrylamide.

7. A method for the preparation of a N-(chloro-C_2–C_8 alkoxymethyl)acrylamide which comprises heating N-(hydroxymethyl)acrylamide with a stoichiometric excess of a chloro C_2–C_8 alkanol at a temperature between about 50°C. and 100°C.

3,957,870

ORGANIC COMPOUNDS

Brian Geoffrey Main, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

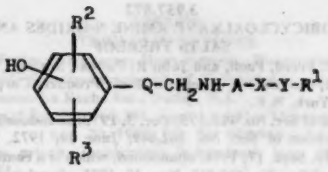
Division of Ser. No. 485,994, July 5, 1974. This application Aug. 26, 1975, Ser. No. 607,932

Claims priority, application United Kingdom, July 19, 1973, 34465/73

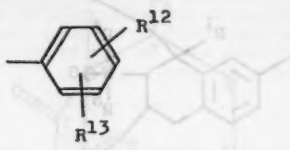
Int. Cl.² C07C *103/34*

U.S. Cl. 260—562 N **6 Claims**

1. A phenylethylamine derivative selected from compounds of the formula:-



wherein A is alkylene of up to 6 carbon atoms, wherein Q is carbonyl or hydroxymethylene, wherein R^1 is alkyl or cycloalkyl each of up to 6 carbon atoms, or aryl of the formula:-



wherein R^2, R^3, R^{12} and R^{13}, which may be the same or different, each is hydrogen, halogen, hydroxy, amino or hydroxymethyl, alkyl, alkoxy, acylamino or alkanesulphonamido each of up to 6 carbon atoms, or aryl of up to 12 carbon atoms, wherein X is NHCO and wherein Y is iminoalkylenecarbonyloxy of up to 6 carbon atoms, or imino, or -NR^1- wherein R^1 is as stated above: and the acid-addition salts thereof.

3,957,871

CHEMICAL COMPOUNDS AND THE PROCESS FOR PREPARING SAME

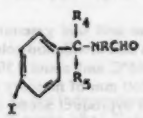
David C. Remy, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 216,264, Jan. 7, 1972, Pat. No. 3,882,130, which is a continuation-in-part of Ser. No. 861,987, Sept. 29, 1969, Pat. No. 3,719,712. This application Feb. 7, 1975, Ser. No. 548,121

Int. Cl.³ C07C *103/34*

U.S. Cl. 260—562 R **5 Claims**

1. A compound of the formula



wherein R_4 and R_5 are lower alkyl substituents.

3,957,872
BENZOBICYCLOALKANE AMINE N-OXIDES AND THE SALTS THEREOF

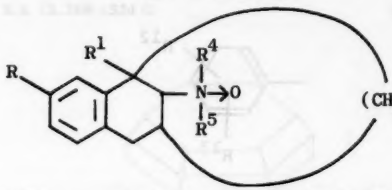
Meier E. Freed, Paoli, and John R. Potoski, Spring City, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 421,375, Dec. 3, 1973, abandoned, which is a division of Ser. No. 262,849, June 14, 1972, Pat. No. 3,836,670, Sept. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 200,517, Nov. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 94,983, Dec. 3, 1970, abandoned. This application Feb. 26, 1975, Ser. No. 553,418 application Feb. 26, 1975, Ser. No. 553,418

Int. Cl.² C07C *91/40*

U.S. Cl. 260—571 5 Claims

1. A compound of the formula:



wherein R is hydrogen, lower alkyl, lower alkyloxy, hydroxy, phen(lower)alkyloxy, halogen, or trifluoromethyl; R^1 is lower alkyl, or phen(lower)alkyl; R^4 is lower alkyl; R^5 is lower alkyl and *n* is an integer from 2 to 6; and the pharmaceutically non-toxic addition salts thereof.

3,957,873
PERACETIC ACID OXIDATION OF AMINES TO AMINE OXIDES

Hubert H. Thigpen; Wallace E. Taylor, and Arthur W. Schnizer, all of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 823,202, Jan. 16, 1969, abandoned, which is a division of Ser. No. 318,117, Oct. 22, 1963, Pat. No. 3,522,279, which is a continuation-in-part of Ser. No. 220,553, Aug. 30, 1962, Pat. No. 3,278,562. This application Sept. 24, 1971, Ser. No. 183,648

The portion of the term of this patent subsequent to Oct. 11, 1983, has been disclaimed.

Int. Cl.² C07C *87/29*, *87/54*

U.S. Cl. 260—576 1 Claim

1. In a process for preparing an amine oxide by reacting an amine with peracetic acid, said amine having a boiling point greater than about 180°C, the improvement which comprises:

introducing said amine in the liquid form into a distillation column at a location near the top thereof;

simultaneously introducing into an intermediate location in said column the gaseous product formed by reacting acetaldehyde and oxygen in the vapor phase to form a gaseous mixture comprising peracetic acid and unreacted acetaldehyde;

reacting said amine and said gaseous product comprising peracetic acid in said distillation column at a temperature between about 65°C and about 150°C and at a pressure of about 50 to 760 mm of mercury absolute to form said amine oxide and byproduct acetic acid;

removing a vapor comprising acetic acid and acetaldehyde from the top of said distillation column; and

recovering a liquid comprising said amine oxide from the base of said column.

3,957,874
CONTINUOUS PRODUCTION OF N-ALKYLARYLAMINES

Toni Dockner, Meckenheim, and Herbert Krug, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 10, 1974, Ser. No. 487,236

Claims priority, application Germany, July 14, 1973, 2335906

Int. Cl.² C07C *87/62*, *121/50*

U.S. Cl. 260—577 9 Claims

1. In a process for the continuous production of N-alkylarylamine by the reaction of an arylamine with an alkanol or a dialkyl ether in the gas phase at a temperature of from 180° to 450°C. in the presence of a carrier substance containing an oxyacid of phosphorus, the improvement which comprises reacting said arylamine with an alkanol of one to four carbon atoms or a dialkyl ether of one to four carbon atoms in each alkyl and using as the catalyst a silicic acid having an internal surface area of from 50 to 500 square meters per gram and having a content of from 0.1 to 20% by weight of phosphoric acid and continuously supplying phosphoric acid or an alkyl phosphate to the catalyst during the reaction.

3,957,875
SYNTHESIS OF BIS[2-(N,N-DIMETHYLAMINO)ETHYL] ETHER

John Lee Ferrell, Hurricane, and Fedor Poppelsdorf, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 10, 1974, Ser. No. 477,810

Int. Cl.² C07C *85/06*

U.S. Cl. 260—585 B 16 Claims

1. Process for producing bis[2-(N,N-dimethylamino)ethyl] ether which comprises reacting trimethylamine with 2-~2-(N,N-dimethylamino)ethoxy] ethanol in the liquid phase, in the presence of a catalytically effective amount of metallic nickel catalyst, for a period of time and at a temperature sufficient to produce bis[2-(N,N-dimethylamino)ethyl] ether, said temperature being within the range of from 50°C. to 300°C.

3,957,876
PROCESS FOR THE OXIDATION OF CYCLOHEXANE

Morris Rapoport, and Jesse Oris White, both of Orange, Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 59,888, July 31, 1970, abandoned. This application May 30, 1973, Ser. No. 365,225

Int. Cl.² C07C *179/02*, *49/30*

U.S. Cl. 260—586 P 3 Claims

1. A process for the oxidation of cyclohexane to produce a product fluid consisting essentially of unreacted cyclohexane, cyclohexanone, cyclohexanol, and cyclohexyl hydroperoxide, the percentage of cyclohexyl hydroperoxide to the total of cyclohexanone, cyclohexanol and cyclohexyl hydroperoxide being greater than 15% by weight, the product fluid being substantially free of peroxides other than cyclohexyl hydroperoxide,

which consists essentially of passing a fluid containing cyclohexane and a cyclohexane soluble cobalt salt selected from the class consisting of cobalt naphthenate, cobalt octoate, cobalt laurate, cobalt palmitate, cobalt stearate, cobalt linoleate, cobalt acetylacetonate and mixtures thereof in the amounts of 0.1 to 5 parts per million parts of product fluid downwardly through a series of oxygen cleanup zones and oxidizing zones at a pressure measured at the top of the oxygen cleanup zone of 60–350 psig. while countercurrently passing an oxidizing gas containing molecular oxygen upwardly through the zones,

the fluid initially passing through a series of oxygen cleanup zones wherein the temperature is maintained in the range of 130° to 180°C. and where the oxygen concentration in

the upward passing gas leaving the oxygen cleanup zone is reduced to less than 4 mole percent,

the fluid then passing through a series of oxidizing zones operated at a temperature in the range of 140°–170°C. in which the level of oxygen is maintained at a level in excess of the amount of oxygen that will react with the

fluid mixture under the particular conditions of that zone by addition of oxidizing gas to that zone, the overall amount of oxygen consumed in the oxidizing zones being not more than 95 mole % of the amount fed;

and recovering product fluid containing cyclohexane, cyclohexanol, cyclohexanone and cyclohexyl hydroperoxide at the exit of the lowest oxidizing zone.

3,957,877
BUTENOYL-CYCLOHEXANONES

Karl-Heinrich Schulte-Elte, and Henri Jindra, both of Geneva, Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

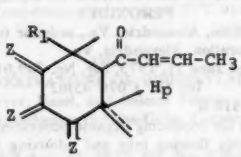
Division of Ser. No. 408,919, Oct. 23, 1973. This application Mar. 20, 1975, Ser. No. 560,225

Claims priority, application Switzerland, Mar. 21, 1973, 4096/73; Oct. 26, 1972, 15691/72

Int. Cl.² C07C *49/30, 49/26, 49/44*

U.S. Cl. 260—586 R **3 Claims**

1. Oxygenated Alicyclic compounds of formula



wherein the symbol R_1 represents an alkyl radical containing from 1 to 6 carbon atoms or a hydrogen atom the index P represents the integers zero or one and one of the symbols Z represents an oxygen atom and each of the other two represent two hydrogen atoms.

3,957,878
TRICYCLIC KETONES

Georg Frater, Greifensee; Hans Greuter, Horgen, and Hans Schmid, Schwerzenbach, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

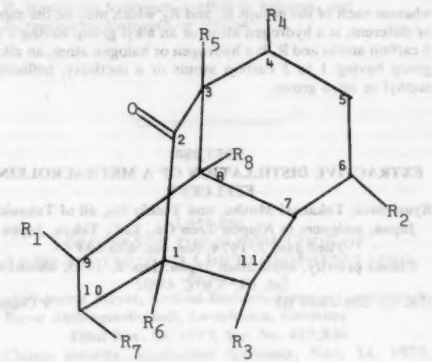
Division of Ser. No. 460,395, April 12, 1974. This application Aug. 29, 1975, Ser. No. 608,946

Claims priority, application Switzerland, Nov. 12, 1971, 16517/71

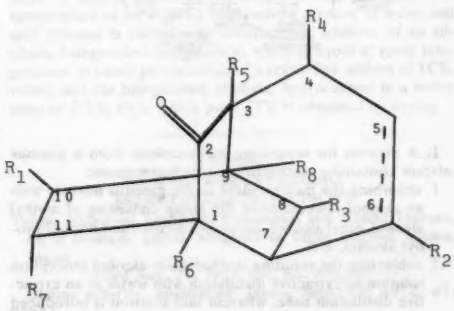
Int. Cl.² C07C *49/54*

U.S. Cl. 260—586 G **6 Claims**

1. A compound selected from the group consisting of tricyclic ketones of the formulae:



and



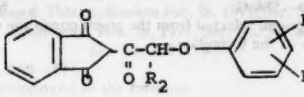
wherein R_1, R_7 and R_8 are independently selected from the group consisting of lower alkyl, hydrogen and lower alkoxy; R_2 is a hydrogen atom, lower alkyl or lower alkenyl; R_3 and R_4 are independently selected from the group consisting of hydrogen or lower alkyl; R_5 and R_6 are independently lower alkyl.

3,957,879
INDANE-1,3-DIONE DERIVATIVES

Jean Mardiguian, Saint-Maur, France, assignor to Societe d'Etude et d'Eploitation de Marques Mar-Pha, France

Filed Sept. 9, 1974, Ser. No. 504,543
Claims priority, application United Kingdom, Sept. 12, 1973, 42904/73
Int. Cl.[2] C07C 49/76
U.S. Cl. 260—590 FA 13 Claims

1. A compound of general formula (I)

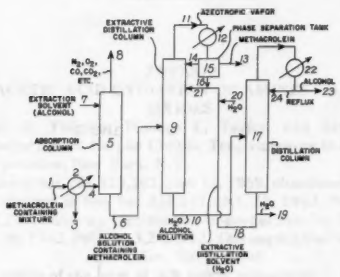


wherein each of the groups R_1 and R_2, which may be the same or different, is a hydrogen atom or an alkyl group having 1 to 3 carbon atoms and R_3 is a hydrogen or halogen atom, an alkyl group having 1 to 3 carbon atoms or a methoxy, trifluoromethyl or nitro group.

3,957,880
EXTRACTIVE DISTILLATION OF A METHACROLEIN EFFLUENT

Ryozi Sato; Takanori Musha, and Yoshio Ito, all of Takaoka, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1974, Ser. No. 430,403
Claims priority, application Japan, Jan. 6, 1973, 48-4819
Int. Cl.[2] C07C 45/02
U.S. Cl. 260—604 HF 9 Claims



1. A process for separating methacrolein from a gaseous mixture containing methacrolein which comprises:

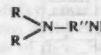
1. absorbing the methacrolein in the gaseous mixture with an alcohol selected from the group consisting of methyl alcohol, ethyl alcohol, iso-propyl alcohol and normal-propyl alcohol, and
2. subjecting the resulting methacrolein-alcohol absorption solution to extractive distillation with water in an extractive distillation zone, wherein said solution is introduced into the middle portion of said zone and the water is caused to flow down from the upper portion of said zone so that the concentration of water in a liquid phase in an absorbing section of said zone is controlled to a concentration in the range from 50 to 90 mole%, thereby to recover the methacrolein as the top distillate of said zone and the alcohol with water as the bottom liquid of said zone and wherein said bottom liquid of the extractive distillation zone is distilled to separate the alcohol from the water.

3,957,881
FIRE RETARDING TEXTILE MATERIALS

Robert Bruce LeBlanc, and Destin A. LeBlanc, both of Wickford, R.I., assignors to Robert Bruce LeBlanc, Wickford, R.I.

Continuation-in-part of Ser. No. 422,058, Dec. 5, 1973. This application June 27, 1974, Ser. No. 483,747
Int. Cl.[2] C07F 9/02
U.S. Cl. 260—606.5 P 6 Claims

1. A water soluble condensation product of a poly(α-hydroxyalkyl)phosphorus compound of the formula
$(RCHOH)_n(RCHR')_{4-n}P\text{-}Y$ or
$(RCHOH)_m(RCHR')_{3-m}P$
and a nitrogen compound of the formula RNH_2, $HO\text{-}R''NH_2$ or



wherein
each R independently is hydrogen or alkyl of 1 to 3 carbon atoms,
R' is OR or

R'' is alkylene of 1 to 3 carbon atoms,
Y is an equivalent amount of the ar ion of at least one acid,
n is an integer from 2 to 4, and
m is 2 or 3,
the phosphorus compound being present in about 0.5 to 6 times the molar amount of the nitrogen compound.

3,957,882
2-HALOETHYLSULFONYL PHOTOGRAPHIC HARDENER COMPOUNDS, COMPOSITIONS, ARTICLES AND PREPARATION PROCESSES

Robert A. Silverman, and Charles J. Wright, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 293,697, Sept. 29, 1972, Pat. No. 3,839,042. This application May 2, 1974, Ser. No. 466,092
Int. Cl.[2] C07C 147/02, 147/06
U.S. Cl. 260—607 A 5 Claims

1. A compound having the structural formula:

in which X is halogen and R is hydrogen, a phenyl or alkyl having from 1 to 6 carbon atoms.

3,957,883
PROCESS FOR OXIDIZING ORGANIC COMPOUNDS TO PEROXIDES

Guenther von Elbe, Alexandria, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Filed June 11, 1973, Ser. No. 369,013
Int. Cl.[2] C07C 45/02
U.S. Cl. 260—610 B 29 Claims

1. A process for producing organic peroxides comprising:

a. continuously flowing into and admixing in a reaction chamber at least two separate streams comprising fluorine in an amount comprising less than 50 volume % relative to the total volumetric amount of fluorine plus oxygen injected into the reaction chamber; an alkane in vapor form having from two to six carbon atoms; and oxygen; said oxygen being flowed separately from said

fluorine and alkane streams or admixed with at least one of said streams;

b. promotiing turbulence within the continuously flowing reaction stream produced by said continuous flowing and admixing of said at least two separate streams;

c. permitting said fluorine, oxygen and alkane to react flamelessly to form said oxygenated organic compound;

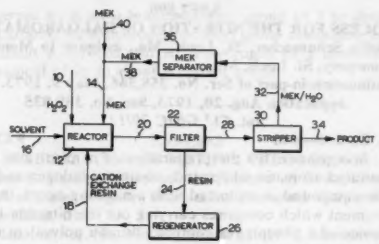
d. continuously removing from said chamber the products formed by the admixture and reaction of said continuously flowing streams; and

e. said oxygen being in an amount sufficient to react with said alkane to produce organic peroxide.

3,957,884
KETONE PEROXIDE PRODUCTION

Douglas M. Bisset, Sarnia, and Colin Mercer, Port Lambton, both of Canada, assignors to Chinook Chemicals Corporation Limited, Toronto, Canada

Filed Sept. 12, 1973, Ser. No. 396,524
Int. Cl.² C07C *179/06*
U.S. Cl. 260—610 R **20 Claims**



1. In a process for the production of an acyclic ketone peroxide which comprises reacting at a temperature below about 35°C (a) an acyclic ketone of the formula R—CO—R′ where R and R′ each are straight or branched chain alkyl groups in which the total number of carbon atoms is from 3 to 6 and (b) hydrogen peroxide in the presence of a cation exchange resin in the hydrogen form and separating the cation exchange resin after completion of said reaction, the improvement which comprises:

i. carrying out said reaction in at least one nonbenzenoid inert solvent, said solvent being a solvent for water, the aliphatic ketone and the ketone peroxide,

ii the quantity of acyclic ketone being at least 1.1 times the molar stoichiometric amount to produce the acyclic ketone peroxide,

iii. the quantity of said solvent being sufficient to maintain a homogeneous reaction medium throughout the reaction and to obtain from said reaction a homogeneous system of said solvent, acyclic ketone peroxide, unreacted acyclic ketone and water, and

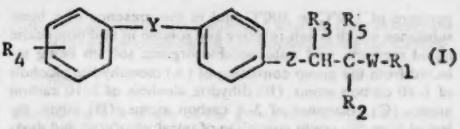
iv. stripping water and unreacted acyclic ketone from said homogeneous system by boiling said homogeneous system at a temperature below about 40°C under a vacuum.

3,957,885
ETHER DERIVATIVES OF DIPHENYLMETHANES

Friedrich Karrer, Basel, and Saleem Farooq, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 23, 1975, Ser. No. 570,978
Claims priority, application Switzerland, Apr. 26, 1974, 5756/74; Mar. 14, 1975, 3260/75
Int. Cl.² C07C *43/20*
U.S. Cl. 260—613 R **5 Claims**

1. A compound of the formula



(I)

wherein

W and Z each represent —O—,

Y represents —CH_2—,

R_1 represents C_1–C_6-alkyl, C_3–C_4-alkenyl, C_3–C_4-haloalkenyl, C_3–C_4-alkenyl, C_3–C_6-cycloalkyl or benzyl,

R_2 represents hydrogen, methyl or ethyl,

R_3 represents hydrogen or methyl, or

R_2 and R_3 together with the chain represent a saturated 5- or 6-membered ring, and

R_4 represents hydrogen, methyl or halogen, and

R_5 represents hydrogen or methyl.

3,957,886
PROCESS FOR THE PURIFICATION OF 2,2-BIS-(4-HYDROXY-3,5-DICHLOROPHENYL)-PROPANE

Karl-Heinrich Meyer, Krefeld-Bockum, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 14, 1973, Ser. No. 415,830
Claims priority, application Germany, Nov. 14, 1972, 2255638
Int. Cl.² C07C *37/44*, *39/16*
U.S. Cl. 260—619 R **6 Claims**

1. A process for the production of very pure 2,2-bis-(4-hydroxy-3,5-dichlorophenyl)-propane (TCB) wherein a solution of the TCB, which is obtained by conventional chlorination methods of 2,2-bix-(4-hydroxyphenyl)-propane, in an aromatic hydrocarbon or halogenated aromatic hydrocarbon is washed with 10–100% of water, based on the weight of said solution, at a temperature of 60°–100°C, the resulting water layer is removed and to the remaining solution 10–100% of water is added, based on the weight of said solution, at a temperature of 60°–100°C, the resulting mixture of water and said solution is cooled with simultaneous addition of an aliphatic halogenated hydrocarbon which is liquid at room temperature to cause precipitation of a crystalline adduct of TCB, water, and the halogenated aliphatic hydrocarbon in a molar ratio of 2:3:1, from which pure TCB is obtained by drying.

3,957,887
PROCESS FOR PREPARING TRIMETHYLHYDROQUINONE

Yataro Ichikawa; Yoshiyuki Yamanaka, and Hideki Tsuruta, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 27, 1973, Ser. No. 391,667
Claims priority, application Japan, Sept. 18, 1972, 47-92842
Int. Cl.² C07C *37/00*
U.S. Cl. 260—621 R **8 Claims**

1. A process for preparing trimethylhydroquinone which comprises heating 4-hydroxy-2, 4, 6-trimethyl-2, 5-cyclohexadiene-1-one under an inert gas atmosphere and in a non-acidic liquid medium having a pH value of 7 to 14 selected from the group consisting of methanol and an aqueous medium selected from the group consisting of water and an aqueous solution of a water-soluble organic solvent at a tem-

perature of 150°C to 300°C and in the presence of a basic substance which is non-reactive and soluble in said non-acidic liquid medium, said water-soluble organic solvent being selected from the group consisting of (A) monohydric alcohols of 1–10 carbon atoms, (B) dihydric alcohols of 2–10 carbon atoms, (C) alkanones of 3–6 carbon atoms, (D) ethers selected from the group consisting of tetrahydrofuran and dioxane, (E) esters selected from the group consisting of methyl acetate, ethyl acetate, propiolactone and methylbenzoate, and (F) amines selected from the group consisting of trimethylamine, triethylamine, pyridine and pyrrolidone, and said basic substance being selected from the group consisting of (a) hydroxides of alkali metals, (b) hydroxides of alkaline earth metals, (c) carbonates and bicarbonates of alkali metals, (d) carbonates and bicarbonates of alkaline earth metals, (e) oxides of alkaline earth metals, (f) alkali dihydrogen phosphate and dialkali hydrogen phosphate, and (g) alkali metal salts of boric acid, citric acid, lactic acid, tartaric acid or acetic acid.

3,957,888

PROCESS FOR THE MANUFACTURE OF BUTYNEDIOL

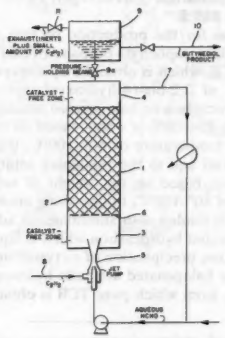
Wolfgang Reiss, Ludwigshafen; Rudolf Schnur, Frankenthal; Siegfried Winderl, Heidelberg-Wieblingen; Herwig Hoffmann, Frankenthal, and Peter Zehner, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Apr. 18, 1975, Ser. No. 569,216

Claims priority, application Germany, May 3, 1974, 2421407

Int. Cl.² C07C *29/00*

U.S. Cl. 260—635 Y 4 Claims



1. An improved process for the continuous production of butynediol by reaction of acetylene and formaldehyde in aqueous solution in the presence of a catalyst containing copper acetylide, the catalyst being contained in a reaction vessel in the form of a suspension or a fixed bed at a pressure of from atmospheric to about 50 bars and a temperature of from about 60° to about 100°C, the improvement consisting in mixing gaseous acetylene and aqueous formaldehyde outside the reaction vessel or at its inlet and passing the mixture into the reaction vessel in the absence of a coherent gas phase, and withdrawing the reaction mixture from said vessel at a point where any gas phase or bubbles formed are removed from the vessel together with the reaction mixture being withdrawn.

3,957,889

SELECTIVE NITRATION OF AROMATIC AND SUBSTITUTED AROMATIC COMPOSITIONS

Barton Milligan, Ardmore, and Donald G. Miller, Boothwyn, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 2, 1975, Ser. No. 574,131

Int. Cl.² C07C *79/10*, *79/12*

U.S. Cl. 260—645 8 Claims

1. In a process for nitrating an aromatic or substituted aromatic composition, wherein nitric acid is contacted with said composition under conditions for effecting nitration thereof, the improvement for enhancing the rate of nitration and the selectivity of the nitration which comprises: carrying out said nitration in the presence of at least an effective amount of soluble anhydrite for selectively enhancing the rate or selectivity of nitration.

3,957,890

PROCESS FOR THE NITRATION OF HALOAROMATICS

Ignatius Schumacher, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 358,566, May 9, 1973. This application Aug. 20, 1973, Ser. No. 389,835

Int. Cl.² G07C *79/12*

U.S. Cl. 260—646 9 Claims

1. In a process for the preparation of a nitro- and halo-substituted aromatic compound, wherein a halogenated aromatic compound is contacted with a nitrating agent, the improvement which comprises carrying out the nitration in the presence of a phosphorus compound and a polyvalent metal element.

3,957,891

SUBSTITUTED ALPHA, BETA-DICHLOROSTYRENES

Samuel Gelfand, Niagara Falls, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Sept. 28, 1973, Ser. No. 401,768

Int. Cl.² C07C *25/28*

U.S. Cl. 260—651 R 4 Claims

1. 2,4,5,α,β -pentachlorostyrene.

3,957,892

STABILIZED VINYLIDENE HALIDE

Joseph P. Kleiman, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

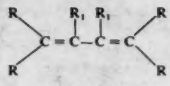
Continuation-in-part of Ser. No. 363,071, May 23, 1973, Pat. No. 3,868,426. This application Dec. 13, 1974, Ser. No. 532,710

Int. Cl.² C07C *17/42*

U.S. Cl. 260—652.5 R 11 Claims

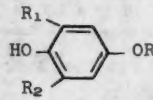
1. As a composition of matter, a vinylidene halide selected from the class consisting of vinylidene bromide and vinylidene chlorobromide stabilized with a stabilizing amount of a mixture of from about 1 to 10 weight per cent of a conjugated and from about 500 to about 10,000 ppm by weight of a phenolic material,

said diene having from 4 to about 12 carbon atoms, and having the formula



wherein R is selected from the class consisting of hydrogen and lower alkyl of up to 8 carbon atoms, and R_1 is selected from the class consisting of hydrogen, chlorine, bromine, and alkyl radicals of up to about 8 carbon atoms, such that no more than one R_1 is halogen,

said phenolic material having up to about 16 carbons and the formula



wherein R_1 is an α-branched alkyl group of 3 to about 8 carbons, R_2 is hydrogen or alkyl group containing up to about 8 carbons and R_3 is hydrogen or a hydrocarbyl radical of up to about 8 carbon atoms.

3,957,893

STABILIZATION OF METHYL CHLOROFORM

Norman L. Beckers, Chardon, and Edward A. Rowe, Mentor, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 243,071, April 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 5,101, Jan. 22, 1970, abandoned. This application Mar. 28, 1974, Ser. No. 455,595

Int. Cl.² C07C *17/40*

U.S. Cl. 260—652.5 R **2 Claims**

1. A stabilized composition which consists essentially of methyl chloroform containing

a. 0.1 to 2.0 percent by weight of a nitroalkane of from 1 to 3 carbon atoms,

b. 0.05 to 0.5 percent by weight of an aliphatic epoxide selected from the group consisting of butylene oxide, propylene oxide, epichlorohydrin, and methyl glycidyl ether, and

c. 0.1 to 3.0 percent by weight of propylene glycol monomethyl ether.

3,957,894

CATALYTIC DIMERIZATION OF CONJUGATED DIENES

Kenji Saeki, Ohtake, and Tetsuo Hayashi, Iwakuni, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Feb. 5, 1974, Ser. No. 439,692

Claims priority, application Japan, Feb. 10, 1973, 48-16106

Int. Cl.² C07C *3/035*

U.S. Cl. 260—666 B **10 Claims**

1. In a method of producing a dimer with a six-membered ring by contacting a catalyst containing iron compounds and organoaluminum compounds with a conjugated diene which is butadiene, isoprene, 1,3-pentadiene, cyclopentadiene or cyclohexadiene, the improvement comprising using a catalyst consisting essentially of the reaction product of:

A. an iron compound selected from at least one of the group consisting of: iron chloride, iron bromide, iron iodide, iron sulfate, iron carbonate, iron hydroxide, iron acetate, iron oxalate, iron acetylacetonate, and ferrocene, present in from about 0.00001 to about 0.05 moles per mole of the conjugated diene;

B. an organoaluminum compound selected from at least one of the group consisting of compounds having the formula

R_2AlR'

wherein each R is one of the group consisting of hydrogen, alkyl having 1 to 8 carbon atoms and phenyl, and R′ is the same as R or is a halogen, with the proviso that when R′ is a halogen each R is an alkyl having 1 to 8 carbon atoms, present in from about 0.1 to about 1,000 moles per mole of iron compound; and

C. nitric oxide, present in from about 0.1 to about 5 moles per mole of organoaluminum compound.

3,957,895

METHOD FOR PRODUCING 5-ALKYLIDENENORBORNENE-2

Mitsuo Matsuno, Kawasaki, Japan, assignor to Nippon Oil Company Ltd., Tokyo, Japan

Filed Mar. 4, 1975, Ser. No. 555,089

Claims priority, application Japan, Mar. 5, 1974, 49-24793

Int. Cl.² C07C *5/24*

U.S. Cl. 260—666 PY **6 Claims**

1. A method for producing 5-alkylidenenorbornene-2 comprising, isomerizing 5-alkenylnorbornene-2 using a compound catalyst obtained by the reaction between organic alkali metal compounds and water, the alkali metals of said organic alkali metal compounds being lithium, sodium and/or potassium and the quantity of water used is 0.01 to 0.9 mole to 1 mole of said organic alkali metal compound.

3,957,896

PROCESS FOR PREPARING 2,6-DIMETHYLNAPHTHALENES

Seiichi Yokoyama; Takanori Urasaki; Michiyuki Tokushiki, and Takeo Shima, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed May 30, 1974, Ser. No. 474,718

Claims priority, application Japan, May 31, 1973, 48-60256

Int. Cl.² C07C *5/24*

U.S. Cl. 260—668 A **10 Claims**

1. In a process for preparing 2,6-dimethylnaphthalene by the selective isomerization of a dimethylnaphthalene (DMN) mixture, which comprises a step of isomerizing a mixture of dimethylnaphthalenes in the presence of a solid acid catalyst, a crystallization step of separating 2,6-dimethylnaphthalene from the resulting isomerized reaction mixture, and a distillation step of separating components having lower or higher components than dimethylnaphthalenes contained in the dimethylnaphthalene mixture at any desired stage of the process with the residue from the crystallization step being recycled to the isomerization step for use as part of the starting material; the improvement comprising:

1. the concentration of 2,6-dimethylnaphthalene in the isomerization reactant for the isomerization reaction is less than the thermodynamic equilibrium concentration, and the weight ratio of dimethylnaphthalenes of group A consisting of 2,6-dimethylnaphthalene (2,6-DMN), 1,6-dimethylnaphthalene (1,6-DMN), and 1,5-dimethylnaphthalene (1,5-DMN) to the dimethylnaphthalenes not belonging to group A is defined by the following equation

$$\frac{\text{Weight of DMN of group } A}{\text{Weight of DMN not belonging to group } A} \leqq 12$$

2. in the isomerization reaction, the concentration C_{26} of 2,6-dimethylnaphthalene in the reaction product expressed in percent by weight based on the dimethylnaphthalenes of group A satisfies the following equation

$$C_{26} = \frac{\text{2,6-DMN (weight)}}{\text{2,6-DMN (weight)} + \text{1,6-DMN (weight)} + \text{1,5-DMN (weight)} \geqq 27 \text{ (weight \%)}} \times 100$$

and the disproportionation ratio D of DMN not belonging to group A, having the following definition:

$$D = \frac{\text{Weight of by-products other than DMN, formed from DMN not belonging to group } A}{\text{Weight of DMN not belonging to group } A \text{ which is contained in the isomerization reactant}} \times 100 \text{ (wt.\%)}$$

and the conversion G, defined as:

$$G = \frac{\text{Weight of DMN not belonging to group } A \text{ formed from DMN of group } A}{\text{Weight of DMN of group } A \text{ contained in the isomerization reactant}} \times 100 \text{ (wt.\%)}$$

satisfy the following equation

$$D \leqq -0.9G + 6.76 \text{ (wt.\%)}$$

3,957,897

METHOD OF OXYDEHYDROGENATION OF ALKYL AROMATIC COMPOUNDS

G. Edwin Vrieland, Midland, Mich., and Hans R. Friedli, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 28, 1974, Ser. No. 473,622

Int. Cl.² C07C *5/48*

U.S. Cl. 260—699 R **14 Claims**

1. A method of dehydrogenating an alkyl aromatic compound, selected from the class consisting of ethyl benzene, ethyl toluene, t-butyl ethyl benzene, diethyl benzene, ring chlorinated or brominated ethyl benzene, ethyl naphthalene, ethyl phenol, and isopropyl benzene to form a derivative having aliphatic unsaturation in the side chain, comprising passing a mixture of said alkyl aromatic compound and an oxygen containing gas in a mole ratio of 0.5 to 4.0 moles oxygen per mole of alkyl aromatic compound, over at least one of calcium, magnesium or strontium pyrophosphate, at a temperature from about 450° to about 650°C.

3,957,898

SYNTHETIC LUBRICATING OILS FROM THERMAL CRACKING OR POLYMERS HAVING VERY HIGH VISCOSITY

Pierleone Girotti; Renato Tesei, and Telemaco Floris, all of San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

No Drawing. Filed Mar. 12, 1974, Ser. No. 450,471

Claims priority, application Italy, Mar. 12, 1973, 21457/73

Int. Cl.² C07C *5/04*; C10M *3/12*

U.S. Cl. 260—676 R **3 Claims**

1. Process for the preparation of synthetic lubricating oil having a high viscosity index, very low pour point, low viscosity at 0°F, high thermal stability, high resistance to depolymerization, high flash point and very low carbon residue, which consists of subjecting polymeric material of very high viscosity and boiling above 175°C, obtained through polymerization of normal alpha-olefines having the general formula $R\text{-}CH=CH_2$ wherein R is an alkyl radical containing from 2 to 16 carbon atoms, in the presence of the catalyst $TiCL_4$/polyiminoalane, in a substantially inert atmosphere containing not more than the quantity of hydrogen which has a manometer pressure of 1 kg/cm², to thermal cracking at atmospheric pressure in the temperature range of 300°C to 420°C for a contact time in the range of 5 minutes to 4 hours, distilling the product so obtained under vacuum to a temperature which corresponds to a distillation temperature of 400°C at atmospheric pressure, and then subjecting the residue with a boiling point higher than 400°C to catalytic hydrogenation.

3,957,899

PRODUCTION OF MONOVINYLACETYLENE

Alexander Ohorodnik, Erftstadt Liblar; Klaus Gehrmann, Erfstadt Lechenich; Günter Legutke, Bruhl, and Hermann Vierling, Hurth, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 10, 1974, Ser. No. 531,323

Claims priority, application Germany, Dec. 17, 1973, 2362603

Int. Cl.² C07C *21/20*

U.S. Cl. 260—678 **4 Claims**

1. In a process for making monovinylacetylene, wherein acetylene is introduced at temperatures within the range 40° and 100°C and under acetylene gas pressures within the range 0.01 and 10 atmospheres (gauge) into a Nieuwland and catalyst type solution being an aqueous copper(I) chloride solution in hydrochloric acid, which is used in admixture with between 0.01 and 10 weight% of an alkali metal salt of an aminocarboxylic acid or of an aminosulfonic 0.1 and wherein acetylene is introduced into the catalyst solution jointly and simultaneously with an inert organic solvent extractant and stripping agent for the resulting monovinylacetylene, the solvent being in vapor form and being continuously passed through the catalyst solution so as to continually strip off monovinylacetylene originating from dimerized acetylene, the improvement which comprises concentrating the catalyst solution by evaporating water therefrom and dissolving additional copper(I) chloride in the catalyst solution so concentrated thereby establishing a molar ratio of copper (1) chloride to alkali metal chloride or ammonium chloride complex former within the range 1.1:1.0 and 1.5:1.0 in the catalyst solution.

3,957,900

METHOD FOR THE DEHYDRATION OF DIOLS

Joseph Edouard Weisang; Georges Szabo, both of Le Havre, and Jean Maurin, Montivilliers, all of France, assignors to Compagnie Francaise de Raffinage, France

Division of Ser. No. 396,219, Sept. 11, 1973, Pat. No. 3,893,946, which is a continuation of Ser. No. 132,892, April 9, 1971, Pat. No. 3,781,222. This application Jan. 21, 1975, Ser. No. 542,717

Claims priority, application France, Apr. 16, 1970, 70.13791

Int. Cl.² C07C *1/24, 29/00*

U.S. Cl. 260—681 **9 Claims**

1. In a method for dehydrating vicinal diols into diolefins and olefin alcohols, the improvement comprising contacting said vicinal diol under dehydration conditions, effected with said diol in the vapor phase, pure or diluted with an inert gas, at a temperature between 350° and 800°C, and with an hourly space velocity of between about 0.5 and 2.5, with a mechanically strengthened catalyst prepared by the method consisting essentially of forming an intimate mixture of finely divided solid particles of at least one pyrophosphate and at least one acid orthophosphate of at least one metal belonging to the group consisting of lithium, sodium, strontium, and barium into a formed mass in a proportion sufficient to give improved mechanical strength to the resulting catalyst and calcinating said mass at a temperature of between about 400° to 600°C to transform said acid orthophosphate into pyrophosphate.

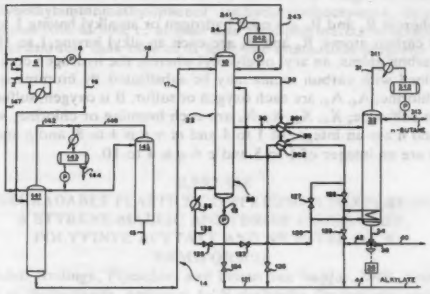
3,957,901
INDIRECT HEAT EXCHANGE IN ALKYLATION

Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 276,096, July 28, 1972, abandoned. This application Apr. 22, 1974, Ser. No. 462,877

Int. Cl.² C07C *3/50*

U.S. Cl. 260—683.43 **7 Claims**



1. In the process for forming an alkylate product stream wherein an olefin and isobutane are reacted in the presence of an alkylation catalyst to form a resultant product stream comprising isobutane, n-butane, isopentane, and alkylate, wherein said resultant product stream is introduced into the upper portion of an isobutane stripping zone, wherein an isobutane vapor stream is withdrawn overhead from said isobutane stripping zone, wherein an isobutane liquid side stream is withdrawn from the isobutane stripping zone and wherein an alkylate stream is withdrawn from the bottom of said isobutane stripping zone,

the improvement comprising,

bringing at least a portion of said alkylate stream into indirect heat exchange relationship with said isobutane liquid side stream, and

reintroducing said isobutane liquid side stream to said stripping zone after said indirect heat exchange relationship approximately at the locus of withdrawal of said isobutane liquid side stream from said stripping zone.

3,957,902
ABSORPTION OF HYDROGEN FLUORIDE IN ALKYLATED HYDROCARBON PRODUCT

Michael Z. Mikulicz, Palatine; William G. Boney, Rolling Meadows, and Bipin V. Vora, Buffalo Grove, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 4, 1974, Ser. No. 520,811

Int. Cl.² C07C *3/54*

U.S. Cl. 260—683.48 **2 Claims**

1. In an alkylation process wherein an olefin and an alkylatable hydrocarbon are contacted with hydrogen fluoride in a reaction zone and wherein waste gases containing HF are collected from said process; the improvement comprising:

a. separating the alkylation reaction mixture from said reaction zone into an alkylated hydrocarbon product, a stream of unreacted alkylatable hydrocarbon and hydrogen fluoride, and a gaseous stream comprising hydrogen fluoride;

b. returning said stream of unreacted alkylatable hydrocarbon and hydrogen fluoride to said reaction zone;

c. contacting said waste gases containing HF and said gaseous stream with a first portion of said alkylated hydrocarbon product to absorb hydrogen fluoride in said product;

d. separating waste gases substantially reduced in HF from said contacting step (c)

e. passing said alkylated product containing absorbed hydrogen fluoride from contacting step (c) to separating step (a), and

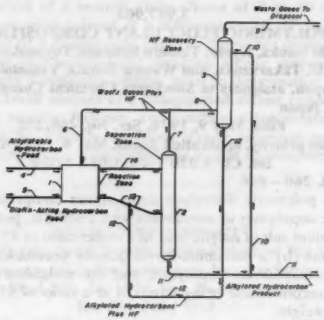
f. recovering a second portion of said alkylated hydrocarbon product from said process.

2. An alkylation process which comprises the steps of:

a. reacting an olefin with an alkylatable hydrocarbon in contact with hydrogen fluoride catalyst in a reaction zone;

b. removing from the reaction zone a gaseous stream containing hydrogen fluoride;

c. supplying the remainder of the alkylation reaction mixture from said zone to a separating zone and therein separating said remainder of the reaction mixture into an alkylated hydrocarbon product, a stream of unreacted



alkylatable hydrocarbon and hydrogen fluoride, and a gaseous stream comprising hydrogen fluoride;

d. returning said stream of unreacted alkylatable hydrocarbon and hydrogen fluoride to said reaction zone;

e. commingling the gaseous stream from separating step (c) with the gaseous stream from step (b) and contacting the resultant mixture with a first portion of said alkylated hydrocarbon product to absorb hydrogen fluoride from the gaseous streams in said portion of the product;

f. supplying resultant HF-containing alkylated product to separating step (c); and

g. recovering a second portion of said alkylated hydrocarbon product from said process.

3,957,903
NOVEL SOLID THERMOSETTING RESINS AND PROCESSES FOR PREPARING SAME

Kazuo Doi, Ohsaka; Takeru Murakami, and Yoshinobu Nakano, both of Neyagawa, all of Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

Continuation of Ser. No. 200,557, Nov. 19, 1971, abandoned. This application July 3, 1974, Ser. No. 485,607

Claims priority, application Japan, Nov. 24, 1970, 45-103440; Nov. 24, 1970, 45-103442; Nov. 24, 1970, 45-103444; June 30, 1971, 46-48387; June 30, 1971, 46-48388

Int. Cl.² C08G *49/00*

U.S. Cl. 260—836 **8 Claims**

1. A process for the preparation of a solid graft copolymeric thermosetting resin comprising:

reacting liquid 1,2-polybutadiene glycol with a diisocyanate chain extender in an organic solvent solution, in a molar ratio of 2/3 to 9/10 mole of diisocyanate per mole of hydroxy groups in said gylcol, to produce a urethanated prepolymer substrate;

adding glycidyl methacrylate to a solvent solution of said urethanated prepolymer in a ratio of 0.04 to 0.48 mole of said glycidyl methacrylate per mole of pendant vinyl groups in said prepolymer and a free radical polymerization initiator to form a first stage reaction mixture;

reacting said first stage mixture until 55 to 65 weight % of the glycidyl methacrylate added has reacted with the prepolymer; and

then adding a second polymerizable monomer to said first stage reaction mixture and reacting same to obtain a graft copolymeric thermosetting resin containing 0.35 to 1.1 moles total of glycidyl methacrylate and second monomer per mole of pendant vinyl groups in the prepolymer substrate, said second monomer being a monomer different from said glycidyl methacrylate.

3,957,904

POLYMERIC FLOCCULANT COMPOSITION

Shin-ichi Isaoka, Kyoto; Tutomu Shintani, Toyonaka; Mamoru Suzuki, Takarazuka, and Wataru Tohma, Yamatotakada, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed May 9, 1974, Ser. No. 468,273

Claims priority, application Japan, May 9, 1973, 48-51916

Int. Cl.[2] C02B *1/20;* **C08L** *61/28*

U.S. Cl. 260—856 **6 Claims**

1. A polymeric flocculant composition comprising (a) an anionic copolymer of acrylamide with a sodium, potassium or ammonium salt of acrylic acid in a molar ratio of 85 : 15 to 80 : 20 and (b) a melamine-formaldehyde precondensate, the anionic acrylamide copolymer and the melamine-formaldehyde precondensate being admixed in a ratio of 95 : 5 to 99 : 1 by weight.

3,957,905

FIRE RETARDANT THERMOPLASTIC POLYESTER TYPE BLOCK COPOLYMER COMPOSITION

Misao Sumoto; Hiroshi Imanaka, and Masaharu Shirai, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

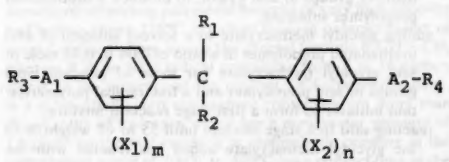
Filed Jan. 17, 1974, Ser. No. 434,144

Claims priority, application Japan, Jan. 18, 1973, 48-8304

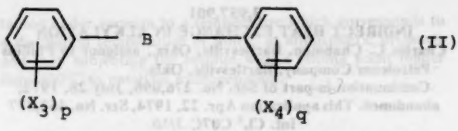
Int. Cl.[2] C08G *51/58, 39/10*

U.S. Cl. 260—860 **18 Claims**

1. A fire retardant thermoplastic polyester block copolymer composition, which comprises (a) a thermoplastic polyester block copolymer consisting of a hard polyester segment having a high melting point and a soft polymer segment having a low melting point and a molecular weight of 400 to 6,000, wherein the hard polyester segment has a melting point of 150°C or more when a high molecular weight polymer is produced from the component thereof alone, and the soft polymer segment has a melting point or softening point of 80°C or less and is included in a ratio of 1 to 85% by weight, and (b) a mixture of one or more kinds of halogenated bisphenyl compounds selected from the group consisting of a compound of the formula (I), and a compound of the formula (II) and an organic or inorganic antimony compound in a ratio of 1:0 to 1:3 by weight:



(I)



(II)

wherein R_1 and R_2 are each hydrogen or an alkyl having 1 to 4 carbon atoms: R_3 and R_4 are each an alkyl having 1 to 18 carbon atoms; an acyl or glycidyl wherein the hydrogen combined with carbon atoms may be substituted by bromine or chlorine; A_1, A_2, are each oxygen or sulfur; B is oxygen, sulfur or sulfoxide; X_1, X_2, X_3, X_4 are each bromine or chlorine; m and n are an integer of 1 to 4 and $m + n$ is 4 to 8; and p and q are an integer of 1 to 5 and $p + q$ is 4 to 10.

3,957,906

CHEMICALLY RESISTANT POLYESTER RESINS COMPOSITIONS

Lloyd R. Buzbee, Pittsburgh, and Robert D. Lake, Monroeville, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 206,854, Dec. 10, 1971, abandoned. This application Sept. 12, 1974, Ser. No. 505,427

Int. Cl. C08L *67/06*

U.S. Cl. 260—861 **31 Claims**

1. A curable polyester resin composition for preparing thermoset articles having improved chemically resistant properties comprising:

A. an ethylenically unsaturated polyester having a molecular weight of about 1,000 to about 4,000; an acid number of no greater than about 30; *and a fumarate to maleate weight proportion of at least about* 80%/20%; said polyester being the polyesterification product of fumaric acid or maleic anhydride or mixtures thereof and an acyclic glycol having a molecular weight of no greater than about 200 and an oxygen content of less than 42.6 wt. %, wherein the amount of said fumaric acid or maleic anhydride is at least about 80 mole % of the acid reactant used to prepare said polyester and wherein the amount of said acyclic glycol is at least about 50 mole % of the polyol reactant used to prepare said polyester; and

B. a vinyl monomeric crosslinking agent in an amount such that the molar ratio of the ethylenic reactive unsaturation in said crosslinking agent to the ethylenic reactive unsaturation of said polyester is between about 3 to 1 and about 5 to 1, and wherein at least 50 wt. % of said crosslinking agent is styrene;

and wherein said polyester is capable of being dissolved by said crosslinking agent at room temperature to form therewith a substantially homogeneous liquid solution.

3,957,907

PHENOLIC-ACRYLIC FAST-CURING SEALANT SYSTEM

Bruce Leffingwell, Southington, Hartford, Conn. 06101

Filed Oct. 24, 1974, Ser. No. 517,736
Int. Cl.² C08K 5/04; C08L 67/06
U.S. Cl. 260—873 6 Claims

1. A storage-stable adhesive composition capable of curing rapidly in the presence of a free-radical catalyst, which composition contains from about 5% to 90% by weight of tris(-dimethylaminomethyl)phenol tri(hydromethacrylate), from about 10% to 90% of at least one vinyl-polymerizable monomer and less than 60% of at least one compatible polyester.

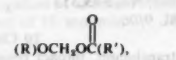
3,957,908

DEGRADABLE PLASTICS COMPRISING A MIXTURE OF A STYRENE-MALEIC ANHYDRIDE COPOLYMER, POLYVINYL ACETATE AND AN ESTER OF A HEMIFORMAL

Adolf Heslinga, Pijnacker, and Petrus Jan Napjus, Delft, both of Netherlands, assignors to Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek Ten Behoeve, The Hague, Netherlands

Filed Jan. 31, 1975, Ser. No. 545,966
Claims priority, application Netherlands, Feb. 18, 1974, 7402178
Int. Cl.² C08L 33/02
U.S. Cl. 260—874 7 Claims

1. A composition of polymers degradable under the influence of water consisting essentially of a mixture of (a) one or more copolymers of an alkenic unsaturated monomer and maleic acid anhydride, (b) one or more copolymers of vinyl esters of lower aliphatic monocarboxylic acids and/or copolymers thereof with other vinyl monomers, and 5 to 50 percent by weight calculated on the total composition, of (c) one or more compounds having the general formula



in which R represents a radical derived from a uni- or polyvalent alkyl or aralkylhydroxyl compound and R′ is a radical derived from a uni- or polyvalent alkyl, aryl, aralkyl or alkarylcarboxyl compound.

3,957,909

ABS POLYMERS WITH SYNTHETIC HYDROCARBON RESINS

Peter James Perron, Pompton Plains, and Joseph Leopold Schafer, Teaneck, both of N.J., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Mar. 3, 1975, Ser. No. 554,842
Int. Cl.² C08L 55/02
U.S. Cl. 260—876 R 9 Claims

1. A high impact thermoplastic composition comprising a blend of

A. at least one graft copolymer of styrene and acrylonitrile copolymer grafted onto a butadiene rubber backbone and

B. a synthetic hydrocarbon resin derived from a liquid fraction of a cracked petroleum stock and having a ring and ball softening point of at least 70°C,

wherein the weight ratio of butadiene rubber to synthetic hydrocarbon resin is maintained in the range from about 1.5 to about 8.

3,957,910

ALKENE POLYMERS MODIFIED WITH HALOGENATED POLYALKENE

Cornelis E.P.V. van den Berg, Geleen, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Nov. 1, 1974, Ser. No. 520,205
Claims priority, application Netherlands, Nov. 2, 1973, 7315042
Int. Cl.² C08F 255/06, 255/00, 110/02, 210/16
U.S. Cl. 260—878 R 24 Claims

1. In a process for preparing alkene polymers, said polymers being ethylene homopolymers and ethylene copolymers, comprising polymerizing ethylene or a mixture of ethylene and a minor amount of a second alpha-alkene of 3 to 10 carbon atoms, in an inert solvent at a temperature of 10° to 220°C with the aid of a Ziegler-type catalyst; thereafter deactivating the catalyst and isolating the resulting alkene polymer, the improvement comprising adding, prior to deactivation of the catalyst, a small amount of a halogenated alkene copolymer, containing reactive halogen, and reacting at temperatures of at least 100°C, whereby modified alkene polymers are produced which have a wide molecular weight distribution.

3,957,911

ALKYL VINYL IMPACT

Jerry G. Higgins, and Cleve H. Forward, both of Big Spring, Tex., assignors to Cosden Technology, Inc., Big Spring, Tex.

Filed Feb. 24, 1975, Ser. No. 552,560
Int. Cl.² C08J 9/18
U.S. Cl. 260—878 R 3 Claims

1. A suspension copolymer of (1) a monomeric 1-olefin having 14 to 60 carbon atoms, (2) a vinyl benzene, and (3) 2 to 10% of a synthetic high cis-polybutadiene rubber having 30 to 98% cis content, said copolymer formed by copolymerizing said vinyl benzene with said monomeric 1-olefin and said rubber to graft polymerize said vinyl benzene both as a polymer and copolymer with said monomeric 1-olefin to said rubber.

3,957,912

METHOD FOR PREPARATION OF ABS TYPE RESINS

David L. Cincera, East Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 26, 1973, Ser. No. 428,154
Int. Cl.² C08C 1/15; C08F 8/02, 291/02
U.S. Cl. 260—880 R 21 Claims

1. A process for production of ABS resins wherein particles of an alkadiene rubber grafted with monovinylidene aromatic and alkenenitrile monomers are dispersed in a matrix copolymer of a monovinylidene aromatic monomer and an alkenenitrile monomer which comprises:

a. grafting by aqueous emulsion graft polymerization an alkadiene rubber with a monovinylidene aromatic monomer and an alkenenitrile monomer to produce grafted rubber particles in an aqueous latex,

b. mixing with said latex from 30 to 400 parts per hundred parts of latex solids by weight of a mixture of at least one monoethylenically unsaturated monomer selected from the group consisting of monovinylidene aromatic monomers and alkenenitrile monomers and at least one saturated solvent for styrene/acrylonitrile copolymer boiling between about 25° and 250°C. at atmospheric pressure in an amount of at least 5 percent by weight of said saturated solvent based on the total weight of solvent plus monomers and wherein said solvent-monomer mixture contains not more than 50 percent by weight of said monovinylidene aromatic monomer,

c. extracting said grafted rubber latex particles from said aqueous latex into the mixture of monomer and solvent forming a dispersion of said particles in the solvent-monomer phase, said aqueous latex forming a separate free water phase,

d. separating said free water phase from said solvent-monomer phase,

e. subjecting said grafted rubber particles dispersed in said solvent-monomer phase and additional monoethylenically unsaturated monomers to mass polymerization conditions to produce an ABS resin composition comprising said alkadiene grafted rubber particles dispersed in said matrix copolymer, unreacted monomers and solvent as a melt and

f. devolatilizing said ABS resin composition melt so as to remove said unreacted monomers and solvent, providing an ABS resin product comprising said matrix copolymer having said grafted rubber particles dispersed therein.

3,957,913
PROCESS FOR THE PREPARATION OF THERMOPLASTIC ELASTOMERIC BLOCK COPOLYMERS

Bernard C. Roest, Geleen, and Herman A. J. Schepers, Stein, both of Netherlands, assignors to Stamicarbon N.V., Geleen, Netherlands

Continuation of Ser. No. 268,172, June 30, 1972, abandoned. This application Apr. 12, 1974, Ser. No. 460,523

Claims priority, application Netherlands, July 2, 1971, 7109143

Int. Cl.² C08L 9/06

U.S. Cl. 260—880 B **6 Claims**

1. Process for preparing elastomeric block copolymers having the general configuration:

$$A - B - (A)_n$$

wherein A is a non-elastomeric polymer block with a number average molecular weight between 200 and 100,000, and a glass transition temperature above 25°C. formed from a monovinyl aromatic compound having from 8–20 carbon atoms per molecule; B is an elastomeric polymer block with a number average molecular weight between 20,000 and 1,000,000, and a glass transition temperature below 10°C. formed from a conjugated diene having from 4–12 carbon atoms in its molecule; and *n* is a whole or fractional number;

comprising polymerizing, in the presence of a polyfunctional anionic initiator, a monomer to form elastomeric block B and thereafter continuing said polymerization also in the presence of said polyfunctional anionic initiator to polymerize a monomer of mixture of monomers to form polymer blocks A attached to polymer block B;

said polyfunctional anionic initiator prepared by reacting (a) a monofunctional anionic initiator having the formula:

$$R - Li$$

wherein R is an alkyl having 1 – 12 carbon atoms or allyl or allyl substituted with a lower alkyl having 1 – 4 carbon atoms; with (b) a monovinyl aromatic compound having from 8 – 12 carbon atoms per molecule the molar ratio of component (a) being from 1 to 5000 for each mole of component (b),

and reacting the polymeric reaction product of (a) and (b) with: (c) a polyvinyl aromatic compound having up to 24 carbon atoms per molecule at a temperature between 10°C. and 150°C. in molar ratio of 0.25 to 10 moles per mole of component (a), and thereafter reacting the cross-linked polymeric reaction product of components (a), (b) and (c) with: (d) a monovinyl aromatic compound having 8 – 12 carbon atoms per molecule in a molar ratio of 0.5 – 100 moles per mole of component (a), to produce said polyfunctional anionic initiator.

3,957,914
CYCLIC POLYMERIZATION PROCESS

Herman J. Baumgartner, Cypress, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 334,817, Feb. 22, 1973, abandoned. This application Sept. 18, 1974, Ser. No. 507,175

Int. Cl.² C08F 8/04, 297/04

U.S. Cl. 260—880 B **5 Claims**

1. The cyclic process which comprises:

a. forming a living polymer by anionic solution polymerization with a lithium-based initiator, the solvent for said solution having a maximum boiling point of X°C at atmospheric pressure, said living polymer having a lithium ion capping at least one end of a polymer chain by a metal-carbon linkage;

b. terminating the polymer by contact in the polymer solution with at least a sufficient amount of a proton-donor organic compound having a boiling point of at least X + 40°C and below 210°C, to react with each lithium ion;

c. subjecting the terminated polymer while still in said solution to hydrogenation, using as the hydrogenation catalyst the reaction product of a nickel, cobalt or iron alkanoate or carboxylate and an organo aluminum reducing agent;

d. coagulating the hydrogenated polymer with steam, said polymer containing minor proportions of the proton donor, the solvent and steam being flashed from the coagulated polymer;

e. heating the polymer sufficiently to volatilize the proton donor;

f. fractionally distilling the solvent phase containing minor amounts of the proton donor whereby a distillate fraction comprising a majority of the solvent is separated from a bottoms phase comprising a majority of the proton donor;

g. and recycling the purified solvent so obtained for use in step a).

3,957,915
TRANSLUCENT IMPACT POLYSTYRENE

James Spanswick, Wheaton, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Apr. 30, 1975, Ser. No. 573,311

Int. Cl.² C08L 9/06

U.S. Cl. 260—880 R **10 Claims**

1. A method for producing a translucent, impact resistant polymer comprising:

a. adding to a polymerization feedstock, comprising 2 to 20% polybutadiene or styrene-butadiene rubber dissolved in a vinyl aromatic, an effective amount between 0.005 to 0.5 weight percent of an additive selected from the group consisting of 1,2-dibromo-2-phenylpropane and methyl-2,3-dibromo-3-phenylpropionate;

b. polymerizing the feedstock; and

c. recovering the polymer,

whereby the Izod value of the polymer is at least 0.6 and the translucency index of the polymer is at least 7.

3,957,916
PROCESS FOR PREPARING A THERMOPLASTIC RESIN WITH PVC DISPERSED THEREIN

Seikichi Tanno; Hisashi Kohkame, and Chikashi Kanno, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 9, 1973, Ser. No. 414,302

Claims priority, application Japan, Nov. 10, 1972, 47-112119

Int. Cl.² C08L 33/18, 25/04, 27/02, 31/02

U.S. Cl. 260—881 **47 Claims**

1. A process for preparing a thermoplastic resin composition which comprises free radical copolymerizing (B) a polymerizable vinyl or vinylidene monomer onto (A) a cross-linked acrylic rubber obtained by copolymerizing a mixture consisting essentially of an acrylate represented by the general formula, CH_2=CH—COOR, wherein R is an alkyl group having 2 to 8 carbon atoms and a cross-linking agent, with (C)

fine particles of a vinyl chloride resin being dispersed in said monomer during graft copolymerization to form a graft-copolymer of (A) and (B) and obtain a thermoplastic resin composition in which the vinyl chloride resin particles are uniformly dispersed in said graft-copolymer.

3,957,917
RESIN COMPOSITION FOR SHAPING INFORMATION CARRIER

Hiroshi Kitaguchi, Kamakura; Katsuya Nakamura; Tsutomu Ueda, both of Tokyo; Tetsuyo Kawahara, Yokosuka, and Mamoru Nakamura, Takaoka, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed June 3, 1974, Ser. No. 475,747
Claims priority, application Japan, June 7, 1973, 48-63341
Int. Cl.² C08L *25/14, 27/06, 31/02*
U.S. Cl. 260—884 **8 Claims**

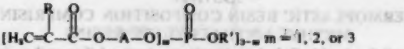
1. A composition for molding information carriers, said composition consisting of a uniformly kneaded mixture of (I) 100 parts by weight of a composite resin having a specific viscosity of 0.16 to 0.40 composed uniformly of (A) 90 to 40% by weight of a vinyl chloride resin having a specific viscosity of 0.16 to 0.28 and (B) 10 to 60% by weight of a methyl methacrylate resin having a specific viscosity of 0.10 to 0.90, said composite resin (I) obtained by post-polymerizing 90 to 40 parts by weight of a monomer which is to form the vinyl chloride resin portion, in the presence of 10 to 60 parts by weight of a methyl methacrylate resin having a specific viscosity of 0.10 to 0.90 using a radical initiator, and (II) 1 to 10 parts by weight of at least one molding additive conventionally used in the manufacture of information carriers, the specific viscosities being measured on a 100 ml. nitrobenzene solution containing 0.4 g of the sample at 30°C., said composition having a melt viscosity of 3×10^3 to 3×10^4 poises at 160°C. at a shearing rate of 10^3 sec^{-1} and a break elongation of at least 10% when stretched at 25°C. at a tensile speed of 10 mm/min.

3,957,918
RADIATION POLYMERIZABLE COATING COMPOSITION CONTAINING AN UNSATURATED PHOSPHORIC ESTER

Ray A. Dickie, Birmingham, and Joseph C. Cassatta, Taylor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 31, 1974, Ser. No. 537,736
Int. Cl.² C08L *31/02*; C08F *8/00*
U.S. Cl. 260—885 **7 Claims**

1. A radiation polymerizable coating composition which, exclusive of non-polymerizable solvents, pigments, initiators and particular fillers, consists essentially of a solution of: (1) between about 90 and about 10 parts of a saturated, thermoplastic vinyl resin free of olefinic unsaturation, having a number of average molecular weight of from about 2,000 to about 250,000 and prepared from at least about 85 weight percent of monofunctional vinyl monomers; (2) between about 10 and about 90 parts of vinyl solvent monomers for said resin, at least about 10 weight percent of said solvent monomers being selected from the group consisting of divinyl monomers, trivinyl monomers, tetravinyl monomers and mixtures thereof,; and (3) between about 1.0 and about 15.0 parts per 100 parts of the total of said thermoplastic vinyl resin and said vinyl solvent monomers of a triester of phosphoric acid bearing one or more sites of vinyl unsaturation and having the formula:



$$[H_2C{=}\underset{R}{\underset{|}{C}}{-}\overset{O}{\overset{\|}{C}}{-}O{-}A{-}O]_m{-}\overset{O}{\overset{\|}{P}}{-}OR']_{3-m} \quad m = 1, 2, \text{ or } 3$$

where:
R = Cl or CH_3
A = C_nH_{2n}, $2 \leq n \leq 6$
R′ = C_1 to C_4 alkyl or C_1 to C_4 chloro- or bromo-alkyl.

3,957,919
THERMOPLASTIC ELASTOMER COMPOSITION AND METHOD FOR PREPARATION

George A. Von Bodungen, and Curtis L. Meredith, both of Baton Rouge, La., assignors to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.

Filed Sept. 24, 1974, Ser. No. 508,826
Int. Cl.² C08L *23/16*
U.S. Cl. 260—897 A **33 Claims**

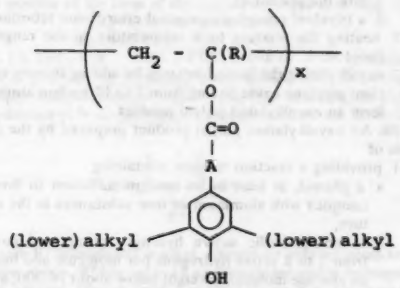
1. A thermoplastic elastomer formed of (1) an EPDM interpolymer of ethylene, monoolefin containing from 3 to 16 carbon atoms and a polyene, (2) a homopolymer of a monoolefin monomer containing from 3 to 16 carbon atoms, and (3) a polyethylene, in which the components are present in the amount of 4-15% by weight polyethylene, with the remainder of 96-85% by weight divided between the EPDM interpolymer and the monoolefin polymer in the ratio of 10-90 parts by weight EPDM interpolymer to 90-10 parts by weight of the monoolefin polymer, said components being subjected to a free radical reaction simultaneously during hot working in the presence of a free radical generating catalyst.

3,957,920
VINYL ESTER POLYMERS CONTAINING HINDERED PHENOLIC GROUPS

Eduard Karl Kleiner, New York, and Martin Dexter, Briarcliff Manor, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 290,425, Sept. 19, 1972, abandoned, which is a continuation of Ser. No. 68,563, Aug. 31, 1970, abandoned. This application Mar. 6, 1975, Ser. No. 556,070
Int. Cl.² C08L *23/06, 23/12*
U.S. Cl. 260—897 B **23 Claims**

1. A polymer containing at least 0.05% by weight of repeating units having the structure



wherein
R is hydrogen or methyl group
A is $-C_nH_{2n}-$ where n is 0 to 6 or
$C_nH_{2n}-O-$ where m is 1 to 6 and
x is 2 or more.

16. An organic material subject to oxidative or thermal degradation stabilized with a polymer of claim 1.

3,957,921

THERMOPLASTIC RESIN COMPOSITION COMPRISING METHYL METHACRYLATE RESINS

Shunji Iwahashi; Fukuichi Morizane, both of Toyonaka, and Yasuyuki Kato, Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Nov. 19, 1973, Ser. No. 416,875

Claims priority, application Japan, Nov. 18, 1972, 47-116024

Int. Cl.² C08L 33/04

U.S. Cl. 260—901 11 Claims

1. A thermoplastic resin composition which consists essentially of from 30 to 80 parts by weight of a methyl methacrylate resin containing at least 80% by weight methyl methacrylate and from 70 to 20 parts by weight of a binary styrene-methyl methacrylate copolymer resin having a weight ratio of styrene/methyl methacrylate of from 80/20 to 30/70 and a reduced viscosity of from 0.5 to 3.5 dl/g in a 1% chloroform solution at 25°C.

3,957,922

PROCESS FOR PREPARING AN OXYALKYLATED PRODUCT AND REACTION PRODUCT THEREOF

Arthur L. Austin, Southgate; William W. Levis, Jr., Wyandotte; Louis C. Pizzini, Trenton, and Robert J. Hartman, Southgate, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 17, 1973, Ser. No. 425,524

Int. Cl.² C07E 9/145

U.S. Cl. 260—921 21 Claims

1. Process for preparing an oxyalkylated product which comprises

1. providing a reaction mixture containing
   a. a phenol, at least in an amount sufficient to form a complex with aluminum or iron substances in the mixture,
   b. a non-phenolic active hydrogen compound having from 1 to 8 active hydrogens per molecule and having an average molecular weight below about 10,000, and
   c. aluminum or iron in a form which will complex with the phenol a), in an amount sufficient to form a complex with the phenol a),
   d. a trivalent phosphorus neutral ester flame retardant,
2. heating the mixture to a temperature in the range of about 80°C. to about 250°C., and
3. oxyalkylating the heated mixture by adding thereto sufficient alkylene oxide having from 2 to 12 carbon atoms to form an oxyalkylated polyol product.

20. An oxyalkylation polyol product prepared by the process of

1. providing a reaction mixture containing
   a. a phenol, at least in an amount sufficient to form a complex with aluminum or iron substances in the mixture,
   b. a non-phenolic active hydrogen compound having from 1 to 8 active hydrogens per molecule and having an average molecular weight below about 10,000, and
   c. aluminum or iron in a form which will complex with the phenol (a), in an amount sufficient to form a complex with the phenol (a),
   d. a trivalent phosphorus neutral ester flame retardant,
2. heating the mixture to a temperature in the range of about 80°C. to about 250°C., and
3. oxyalkylating the heated mixture by adding thereto sufficient alkylene oxide having from 2 to 12 carbon atoms to form an oxyalkylated polyol product.

3,957,923

ALKYL AND HALOALKYL N,N'-DIALKYL-N-METHYLOLPHOSPHORODIAMIDATES

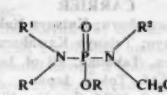
Patrick Michael Burke, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 373,144, June 25, 1973, Pat. No. 3,897,522, which is a continuation-in-part of Ser. No. 261,812, June 12, 1972, abandoned. This application Feb. 18, 1975, Ser. No. 550,619

Int. Cl.² C07F 9/24; C06C 27/00

U.S. Cl. 260—936 4 Claims

1. Alkyl phosphorodiamidate having the formula



wherein

R is C_{1-5} alkyl having 0–3 substituents selected from chloro and bromo,

R^3 is H or C_{1-4} alkyl,

R^4 is H or CH_2OR^5 wherein R^5 is H or C_{1-4} alkyl, and

R^1 and R^2 conjointly is C_{2-5} alkylene, provided that all carbon atoms alpha to the amide nitrogen and ester oxygen atoms are free of halo substituents.

3,957,924

O,S-DIALKYL URIDO THIOPHOSPHATES

Willy Meyer, Basel; Beat Bohner, Binningen, and Dag Dawes, Pratteln, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

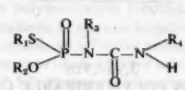
Filed Sept. 30, 1974, Ser. No. 510,340

Claims priority, application Switzerland, Oct. 5, 1973, 14260/73; July 24, 1974, 10211/74

Int. Cl.² C07F 9/38; A01N 9/36

U.S. Cl. 260—938 37 Claims

1. A compound of the formula



wherein

R_1 represents C_3–C_8 alkyl,

R_2 represents methyl or ethyl,

R_3 represents C_1–C_4 alkyl or C_3–C_4 alkenyl, and

R_4 represents unsubstituted phenyl, or phenyl mono- or oly-substituted, identically or differently by C_1–C_3 alkyl, methoxy, methylthio, trifluoromethyl, chlorine, bromine, nitro, ethoxycarbonyl, cyano, acetyl, acetylamino, methylaminocarbonyl or dimethylaminocarbonyl.

3,957,925

THIOPHOSPHATES

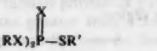
Bernardus A. Oude Alink, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed July 22, 1971, Ser. No. 165,336

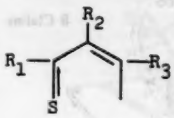
Int. Cl.² C07F 9/16

U.S. Cl. 260—947 10 Claims

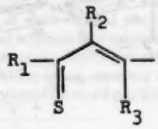
1. Thiophosphates of the formula



where X is O or S, R is alkyl, aryl, cycloalkyl, aralkyl or alkaryl and R′ is of the formula



or



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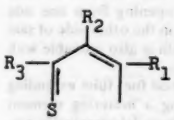

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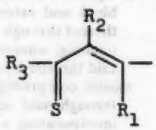


where R_1, R_2 and R_3 are hydrogen, alkyl, aryl, cycloalkyl, alkenyl, alkynyl, alkaryl, aralkyl, or heterocyclic groups.

3,957,926
NITROARYL PHOSPHONATES

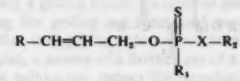
Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 298,979, Oct. 19, 1972, Pat. No. 3,862,999, which is a division of Ser. No. 123,467, March 11, 1971, abandoned. This application Nov. 18, 1974, Ser. No. 524,904

Int. Cl.² C07F 9/40; A01N 9/36

U.S. Cl. 260—954 **9 Claims**

1. Compounds corresponding to the formula



wherein R is selected from the group consisting of hydrogen, alkyl and aryl; R_1 is alkyl; R_2 is nitro-substituted aryl; X is oxygen, sulfur or amino.

3,957,927
MANUFACTURE OF PHOSPHORUS NITRIDE ESTERS

Rolf Wurmb, Heidelberg; Dietmar Werner, Weisenheim; Gerd Wunsch, Speyer; Volker Kiener, and Wolfgang Schwarz, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 2, 1974, Ser. No. 485,073

Claims priority, application Germany, July 3, 1973, 2333746

Int. Cl.² C07F 9/21

U.S. Cl. 260—973 **3 Claims**

1. A process for the manufacture of phosphorus nitride esters serving as flameproofing agents of high wash resistance for use on regenerated cellulose which comprises: reacting cyclic phosphorus nitride chlorides of the formula: $(NPCl_2)_{3-4}$ with equivalent amounts of saturated or ethylenically unsaturated, straight-chain or branched-chain primary alcohols of from 2 to 6 carbon atoms or with mixtures of primary alcohols which contain an average of from 2 to 6 carbon atoms, are reacted in the presence of pyridine or triethylamine by first reacting from 10 to 80% of the equivalent amount of alcohol for from about 1 to 5 hours with the phosphorus nitride chloride at from 10° to 50°C and then adding alcohol in an excess of from 10 to 100% and continuing the reaction at from 10° to 50°C and finally completing the reaction by heating to from 50° to 100°C.

3,957,928
S-AMMONIUM-O-HYDROCARBYL-N-ACYL PHOSPHORAMIDOTHIOATE SALT PRODUCTION AND REACTION WITH ALKYLATING AGENT

Hans G. Franke, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

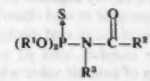
Continuation-in-part of Ser. No. 317,479, Dec. 21, 1972, Pat. No. 3,832,425. This application June 17, 1974, Ser. No. 479,973

The portion of the term of this patent subsequent to Aug. 27, 1991, has been disclaimed.

Int. Cl.² C07F 9/32; A01N 9/36

U.S. Cl. 260—978 **12 Claims**

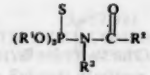
1. A process for preparing S-ammonium salts of N-acylphosphoroamidothioates which comprises reacting an O,O-dihydrocarbyl-N-acylphosphoroamidothioate of the formula



wherein R^1 individually is alkyl, alkenyl, or alkynyl of up to 6 carbon atoms, R^2 has up to 18 carbon atoms and is hydrogen, alkyl, alkenyl, phenyl, aralkyl or alkaryl substituted with up to 3 fluorine, chlorine or bromine atoms or with up to 1 alkoxy or alkylthio of 1 to 4 carbon atoms, and R^3 is hydrogen or alkyl of 1 to 6 carbon atoms, with an ammonium sulfide or polysulfide in liquid phase in liquid ammonia at a temperature of about −35°C. to 75°C.

9. A process for producing an O-hydrocarbyl-S-hydrocarbyl-N-acylphosphoroamidothioate which comprises:

1. reacting an N-acylphosphoroamidothioate of the formula



wherein R^1, R^2 and R^3 are as defined in claim 1, and an ammonium sulfide or polysulfide in liquid phase in liquid ammonia at a temperature of aout −35°C. to 75°C. to produce an S-ammonium salt of the N-acylphosphoroamidothioate;

2. evaporating the liquid ammonia; and

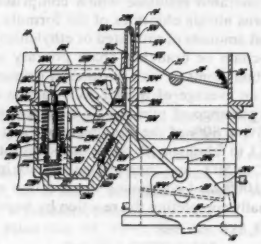
3. reacting the resulting S-ammonium salt with an alkylating agent to produce the O-hydrocarbyl-S-hydrocarbyl-N-acylphosphoroamidothioate.

3,957,929

CARBURETOR HAVING PRIMING MEANS

John A. Gural, Pittsford, and John W. Moulds, Penfield, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed May 9, 1974, Ser. No. 468,439
Int. Cl.² F02M 7/08
U.S. Cl. 261—34 A **1 Claim**



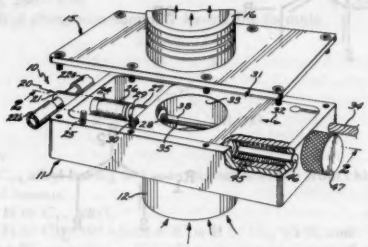
1. A carburetor comprising a mixture conduit having an air inlet, a throttle disposed in said mixture conduit and movable between closed and wide open positions for controlling flow therethrough, an air valve disposed in said mixture conduit anterior said throttle and defining a controlled pressure region therebetween, said air valve being movable between a closed position, an open position and other positions, means positioning said air valve in accordance with the pressure in said region whereby the position of said air valve is a measure of the rate of air flow through said mixture conduit, a fuel bowl, means for supplying fuel from said bowl to said region in accordance with the position of said air valve and the pressure in said region, means defining a lost motion connection between said throttle and said air valve for moving said air valve from said closed position to said open position as said throttle approaches said wide open position, a primer pump chamber disposed adjacent said fuel bowl and having means for receiving fuel from said bowl, a discharge passage extending from said chamber to a jet opening into said mixture conduit, said discharge passage having a cavity exposed to the atmosphere, a primer pump plunger operable in said chamber for discharging fuel from said chamber through said discharge passage and said jet into said mixture conduit, said jet opening into said mixture conduit upstream of said air valve when said air valve is in said closed position and downstream of said air valve when said air valve is in said open position whereby fuel would be discharged upstream of said air valve if said air valve were in said closed position and is discharged into said region when said air valve is in said open position, and means defining a lost motion connection between said throttle and said primer pump plunger for operating said plunger to discharge fuel only as said throttle approaches said wide open position, whereby as said throttle is moved to said wide open position said air valve is moved to said open position and said primer pump plunger is operated to discharge fuel through said jet into said region, and whereby when said air valve is in said closed position said jet is precluded from bleeding air into said controlled pressure region.

3,957,930

CARBURETOR

James R. Birmingham, 9407 Muroc, Bellflower, Calif. 90706

Continuation-in-part of Ser. No. 212,325, Dec. 27, 1971, abandoned. This application June 24, 1974, Ser. No. 482,567
Int. Cl.² F02M 9/06
U.S. Cl. 261—44 R **8 Claims**



1. A carburetor comprising:

means defining an air passageway, for directing an airstream;

a movable throttle block having an airstream opening therein and movable across said passageway;

a tapered metering pin carried by said movable throttle block and extending across said opening from one side thereof through a lateral aperture in the other side of said opening; whereby said metering pin is also movable with said throttle block;

means, comprising a fixedly positioned fuel tube extending through said aperture and having a metering element incorporating a fuel dispensing bore telescopically embracing said metering pin, for dispensing fuel into said airstream;

said fuel dispensing bore being fixedly positioned in predetermined relation to said air passageway;

said fuel tube comprising a flexible tubing alignment sector;

means for moving said throttle block for causing said airstream opening to throttle said airstream to a given extent, and for causing a selectable section of said tapered metering pin to occupy said bore of said fixedly positioned fuel tube, for metering a given amount of fuel into said airstream in accordance with the position of said block;

and a sealing means movable with said block and surrounding said metering pin at said one side of said opening and being sealably engageable with said fuel dispensing bore when said throttle block is moved to a position closing said air passageway.

3,957,931

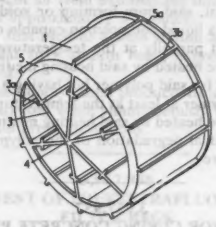
FLUID-FLUID CONTACT METHOD AND APPARATUS

Stephen Robert Mercer Ellis; Ronald Priestley, both of Birmingham, and Kevin Joseph McKeown, Newcastle, all of England, assignors to Mass Transfer Limited, Newcastle, England

Continuation of Ser. No. 209,969, Dec. 20, 1971, abandoned. This application Feb. 26, 1974, Ser. No. 445,961
Claims priority, application United Kingdom, Dec. 18, 1970, 60280/70; Oct. 4, 1971, 46165/71
Int. Cl.² B01F 3/04
U.S. Cl. 261—98 **24 Claims**

2. Fluid-fluid contact apparatus comprising a packed bed and means for introducing fluids to said bed for contact therein in which at least a part of the bed is a dumped bed formed of packing members each of a given overall length and

including an open-ended tubular portion of given width having a diameter to width ratio greater than 1.5:1 one or more protuberances extending inwardly from the inside wall of said tubular portion, the ratio of the diameter of said tubular portion to the overall length of each of said packing members being greater than 1.5:1, and wherein said ratios and protuberances tend to facilitate a generally horzontal orientation of a greater percentage of members when dumped into said bed than is the case with conventional dumped packing members.

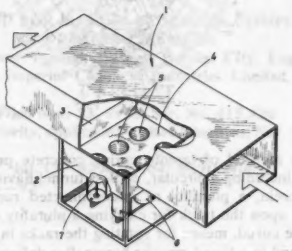


3,957,932

HUMIDIFIER

Robert L. White, St. Charles, Mo., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Nov. 26, 1974, Ser. No. 527,503
Int. Cl.² F24F *3/14*; H05B *3/00*
U.S. Cl. 261—142 **5 Claims**



1. A humidifying device comprising an elongated pan with a bottom and a plurality of relatively short sides, said bottom having a plurality of openings therein, each opening being in communication with upwardly extending side walls of an elongated chamber, said side walls being longer than said short sides of said pan, said chamber having the same cross-sectional area as said opening; and, each chamber having disposed therein an elongated heating element.

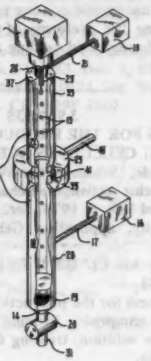
3,957,933

APPARATUS FOR PRODUCING MICROSPHERICAL PARTICLES AND METHOD FOR OPERATING SUCH APPARATUS

Walter Egli; William H. Bailey, Jr; David F., Leary, all of San Diego, and Richard J. Lansley, Del Mar, all of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Mar. 5, 1975, Ser. No. 555,694
Int. Cl.² B29B *1/03*
U.S. Cl. 264—14 **7 Claims**

1. Apparatus for producing microspherical particles, comprising, a droplet generator for dispensing uniform spherical droplets of a chemically gellable substance, a gelling column positioned for receiving droplets from said droplet generator, said gelling column being sealed at both ends to prevent entry of air thereinto, means at the lower end of said gelling column for confining a gelling liquid, a source of gelling gas, means for introducing the gelling gas from said source thereof to the region within said gelling column and immediately above the gelling liquid, a source of a further gas of a density lower than that of the gelling gas, means for introducing the further gas



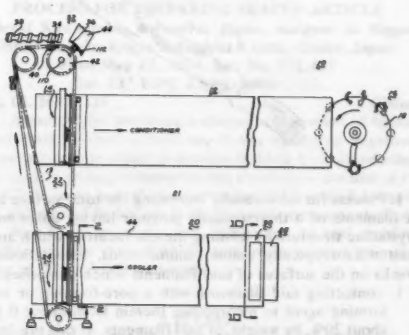
from said source thereof to the region within said gelling column and immediately above the gelling gas, and means for withdrawing gases from said gelling column at the interface between said region of the gelling gas and said region of the further gas.

3,957,934

FORMING MOLECULARLY ORIENTED CONTAINERS FROM PREFORMS

L. John Berggren, Simsbury, and Joseph R. Reilly, Naugatuck, both of Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed Sept. 19, 1974, Ser. No. 507,395
Int. Cl.² B29C *17/07*, *25/00*
U.S. Cl. 264—40 **8 Claims**



1. In a method of conditioning thermoplastic preforms to be molded into molecularly oriented containers, which method includes:

feeding groups of preforms at elevated temperature to and through a temperature-conditioning zone to reduce at least portions thereof to molecular orientation temperature for immediate molding into containers while at said orientation temperature;

the improvements in said method whereby preforms are conveniently treated to accommodate later molding after

reheating to molecular orientation temperature, which improvements comprise, in combination, the steps of:

A. diverting other groups of preforms at elevated temperature away from and without entering said temperature-conditioning zone to an adjacent cooling zone;

B. reducing the temperature of preforms of said other groups to substantially below molecular orientation temperature in said cooling zone; and then

C. collecting the preforms of said other groups after passing through said cooling zone for said later molding.

3,957,935

PROCESS FOR THE PRODUCTION OF A DRY DESALTING CELLULOSE ACETATE MEMBRANE

Eberhard Staude, Schlangenbad-Wambach, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Dec. 5, 1974, Ser. No. 529,839

Claims priority, application Germany, Dec. 10, 1973, 2361369

Int. Cl.[2] B29D 7/02, 27/04

U.S. Cl. 264—41 2 Claims

1. In the process for the production of a dry cellulose acetate membrane comprising forming a sheet material from a cellulose acetate solution, treating the sheet material with a liquid and drying,

the improvement consisting essentially of treating the sheet material with an aqueous solution of a polyvalent aliphatic alcohol having 2 to 4 carbon atoms for about 2 to 10 minutes at a temperature in the range of about 50° to 110°C, and drying said sheet material at a temperature not in excess of about 50°C.

3,957,936

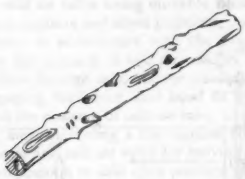
HIGH TEMPERATURE PROCESS FOR MODIFYING THERMOPLASTIC FILAMENTOUS MATERIAL

Alfred E. Lauchenauer, Thurgau, Switzerland, assignor to Raduner & Co., AG, Horn, Thurgau, Switzerland

Filed July 22, 1971, Ser. No. 165,201

Int. Cl.[2] B29D 27/00

U.S. Cl. 264—53 16 Claims



1. Process for substantially increasing the total surface area of filaments of a thermoplastic polymer having an oriented crystalline structure by forming therein vacuities which are at least microscopically visible, and/or voids, indentations or cracks on the surfaces of said filaments which comprises:

1. contacting said filaments with a pore-forming or void-forming agent to incorporate therein from about 0.1 to about 20%, by weight, of said filaments, of said pre-forming or void-forming agent;

2. subjecting said filaments for a period of less than about 15 seconds and in the absence of longitudinal stress to a heating medium which is at a temperature of at least 100°C. above the glass transition temperature of said polymer, the temperature of said heating medium being such that the polymer would lose more than 85%, of its tensile strength if said filaments were subjected thereto for a period of more than about one minute, the temperature and time of exposure to said heating medium being such that the peripheral portions of the filaments are affected to a larger degree than the inner portions, thereby creating between the periphery and the inner portions a temperature gradient, and

3. immediately cooling said filaments by subjecting them to a cooling medium, said cooling reversing said temperature gradient, said pore-forming or void-forming agent comprising a liquid composition capable of being volatilized at least partially at the temperature to which said filaments are heated by said heating medium and being a non-solvent for said polymer but having a swelling action for said polymer at least at the temperature to which said filaments are heated by said heating medium and will not cause chemical degradation of the polymer to any substantial degree.

3,957,937

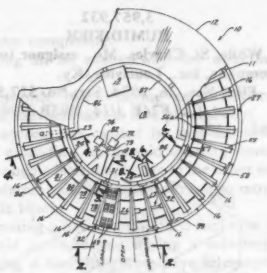
METHOD FOR CURING CONCRETE PRODUCTS

Paul W. Lovell, Logan, Iowa, assignor to Cyclamatic, Inc., Cedar Rapids, Iowa

Division of Ser. No. 125,661, March 18, 1971, abandoned. This application Apr. 23, 1974, Ser. No. 463,320

Int. Cl.[2] C04B 15/12

U.S. Cl. 264—82 5 Claims



1. The method of rapidly curing concrete products in a machine including a circular, endless tunnel having a circular track therein, a plurality of interconnected racks movably mounted upon the track for carrying a plurality of the products to be cured, means for rotating the racks in an indexing manner and in a timed manner hereinafter defined, each rack having a solid divider panel with a peripheral seal for coaction with each of a plurality of seals secured about the interior of the tunnel in arcuately spaced relation to form with each coaction a substantially hermetical sealed wall thereby forming a plurality of continuously formed hermetically sealed stations within the tunnel, the method comprising the steps:

loading at least one of the products onto a first rack at a first station within the tunnel, said first station open to the atmosphere;

moving the first rack to the next adjacent station within the tunnel, said next station being a second station automatically sealed by coaction of the rack seals with the tunnel seals, while repeating the loading action at the first station on a second rack;

introducing a superheated steam and carbon dioxide into the second station and maintaining the temperature within said second station at a range of 175° to 250° F. for approximately 12 minutes;

moving said first rack to a third automatically sealed station adjacent to said second station while simultaneously repeating the action at said previous stations;

introducing a non-superheated steam into the third station and maintaining the temperature therein at a range of 195° to 200° F. for approximately 60 minutes;

moving said first rack to a fourth automatically sealed station adjacent said third station while simultaneously repeating the actions at said previous stations;

exposing the first rack in said fourth station to ambient air from external the tunnel for approximately 12 minutes;

moving said first rack to a fifth automatically sealed station adjacent said fourth station while simultaneously repeating the actions at said previous stations;

forcing ambient air from external the tunnel into said fifth station for approximately 3 minutes;

moving said first rack to a sixth station adjacent said fifth station, said sixth station being exposed to the atmosphere; and

unloading the rapidly cured products from the first rack at the sixth station, while simultaneously repeating the actions at said previous stations.

3,957,938
PRETREATMENT OF POLYTETRAFLUOROETHYLENE FILTER BAGS

Mark L. Gravley, Oregon, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 21, 1974, Ser. No. 516,481

Int. Cl.² B01D *39/08, 29/14;* **B29C** *25/00*

U.S. Cl. 264—85 **3 Claims**

1. A method of stabilizing a filter bag fabricated from a preshrunk woven polytetrafluoroethylene fabric, said bag having from about 2 to about 10 percent residual longitudinal shrinkage which comprises installing said bag in a filter unit with from about 2 to about 10 percent longitudinal slack based upon the length of said bag, heating said bag by passing a heated inert gas therethrough at a temperature in the approximate range of 450°–500°F for a period of about 20 to about 30 hours.

3,957,939
METHOD FOR MANUFACTURING A COMPOSITE BEARING MEMBER

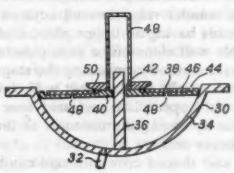
Arthur Trevor Voaden, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 13, 1973, Ser. No. 415,426

Claims priority, application United Kingdom, Nov. 27, 1972, 54673/72

Int. Cl.² B29C *17/04;* **B29D** *3/00*

U.S. Cl. 264—92 **9 Claims**



1. A method for the manufacture of a bearing member comprising forming a thermoplastic base sheet with a recess in the surface inwardly of the outer periphery of the sheet and substantially concentric with the sheet, heating the base sheet to a temperature at which the thermoplastic is readily deformable by fluid pressure, placing an insert formed from a sheet of a material selected from the group consisting of tetrafluoroethylene homopolymers and filled tetrafluoroethylene homopolymers in the recess before, after, or during the heating step, the insert, prior to the heating step, fitting within the recess with a small gap left between the outer edge of the insert and the adjacent edge of the recess, positioning the assembly of the base sheet and the insert in a concave mould with the periphery of the base sheet free to move over the mould surface, subjecting the assembly of the base sheet and the insert to fluid pressure to cause it to conform to the shape of the mould surface and allowing it to cool in this position, whereby the shaping and cooling contraction cause the gap to close so that the insert becomes firmly gripped at its outer periphery by the edge of the recess and the assembly as a whole becomes form stable.

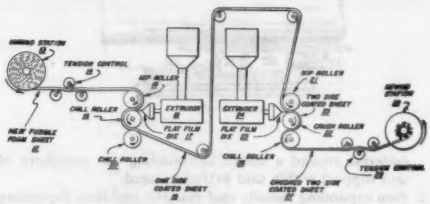
3,957,940
WRINKLE FREE EXTRUSION COATING OF HEAT FUSIBLE FOAM SHEET

John C. Schubert, and Edward C. Le Duc, both of Chippewa Falls, Wis., assignors to Standard Oil Company, Chicago, Ill.

Continuation of Ser. No. 312,953, Dec. 7, 1972, abandoned. This application May 31, 1974, Ser. No. 475,171

Int. Cl.² B29F *3/10*

U.S. Cl. 264—171 **10 Claims**



1. A process for coating two sides of a heat fusible foam sheet with a resinous polymeric material compatibly heat fusible with said heat fusible sheet comprising: (1) melting the resinous polymeric material; (2) extruding the resinous polymeric material through at least one flat film die sequentially onto the first and then the second side of the heat fusible foam sheet wherein the contacted heat fusible foam sheet and said resinous polymeric material are crushed simultaneously with the second side being coated such that it rebounds to only 40 to 60 percent of its original thickness whereby a coated sheet is produced which does not give rise to wrinkles, cracks, or other surface blemishes when said coated sheet is passed around rollers that give rise to a change in direction of travel of said coated sheet of more than 90° and the ratio of the arc diameter of said roll to thickness of said coated sheet is as low as 100.

3,957,941
PROCESS FOR PREPARING SHAPED ARTICLE

Hideaki Kawaguchi, Toyonaka, Japan, assignor to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 22, 1974, Ser. No. 472,482

Int. Cl.² B29C *25/00;* **B29D** *7/20*

U.S. Cl. 264—234 **5 Claims**

1. A process for preparing a shaped article made of hydrolyzed ethylene-vinyl acetate copolymer having an improved impact resistance, which comprises molding hydrolyzed ethylene-vinyl acetate copolymer having an ethylene content of 15 to 60 % by mole, a vinyl acetate content of 85 to 40 % by mole and a degree of hydrolysis in vinyl acetate component of not less than 85 % by mole, and, subsequent to said molding conditioning the shaped article to contain water within the range of 0.2 to 3.0 % by weight.

3,957,942
PROCESS OF COATING AN ELONGATED SUPPORT

Henri Meudec, Paris, France, assignor to Rol, Auxerre, France

Continuation of Ser. No. 220,522, Jan. 24, 1972, abandoned, which is a division of Ser. No. 12,639, Feb. 19, 1970, abandoned. This application Jan. 2, 1974, Ser. No. 429,840

Claims priority, application France, Feb. 20, 1969, 69.04362

Int. Cl.² B29F *3/10*

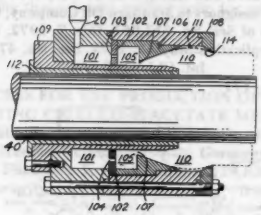
U.S. Cl. 264—235 **3 Claims**

1. A process of coating an elongated support with a plastic material selected from vulcanizable rubber compounds, heat

softened thermoplastic polymers or plasticized resins which comprises the steps of:

a. radially feeding under pressure said material into an inlet end of an elongated extrusion head having an exit end and having an elongated support centrally inserted in axial position;

b. sequentially decompressing, homogenizing, decompressing again, compacting while uniformly distributing said



material around a sleeve surrounding the periphery of said support within said extrusion head;

c. then expanding radially said material and then depositing it on said support in the form of a sheath; and

d. while moving said support with said sheath deposited thereon towards the exit end and through the exit end of the extrusion head guiding and forming the sheath into a compacted coating of predetermined thickness.

3,957,943

METHOD FOR PRODUCING GLASS FIBER REINFORCED PLASTIC MOLDED ARTICLES WITH DECORATIVE PATTERNS AND ARTICLE PRODUCED THEREBY

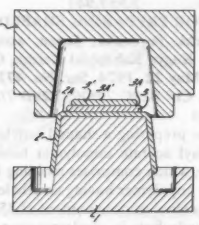
Shoji Ogura, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 304,718, Nov. 8, 1972, abandoned. This application Dec. 23, 1974, Ser. No. 535,289

Claims priority, application Japan, Nov. 9, 1971, 46-89264

Int. Cl.² B29C 9/00

U.S. Cl. 264—245 **4 Claims**



1. A method for producing a glass fiber reinforced plastic molded article comprising a pair of surfaces and an edge portion therebetween, and having a decorative pattern forming an integral part of at least one of said surfaces, which comprises the steps of providing at least two sheet molding compound mats, each of said mats comprising glass fibers impregnated with thermosetting resin, said resin impregnated in each of said mats including different colorants to provide at least two mats of different color, said resin impregnated in each of said mats being present in sufficient quantity and adapted to be fluidized upon application of heat and pressure thereto; separately placing said at least two kinds of differently colored sheet molding compound mats in separate layers on a first mold portion, the area of each mat being less than the molding surface area of said first mold portion; putting together a second mold portion on to said first mold portion with said layers of said sheet molding compound mats interposed between said first and second mold portions, said first and second mold portions forming a mold; applying heat and pressure to said mold, and fluidizing said differently colored resin in said layers of said at least two mats so as to cause said differently colored resins to flow in the space between said mats and mold portions and be mingled with each other in said mats, thereby forming an article comprising a single layer of a thickness substantially less than that of said layers of said sheet molding compound mat, and curing said sheet molding compound mats between said mold portions, whereby said differently colored sheet molding compound mats are mingled with each other to form a flow pattern of the distinct colors of each of said sheet molding compound mats on at least one of said surfaces of said article.

3,957,944

METHOD OF MAKING CLOSURE DEVICE FOR CANS AND OTHER CONTAINERS

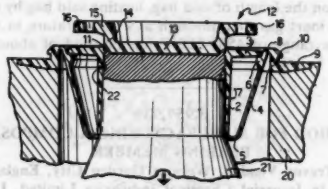
Piergiacomo Guala, Alessandria, Italy, assignor to Angelo Guala S.p.A., Alessandria, Italy

Filed Mar. 25, 1974, Ser. No. 454,510

Claims priority, application Italy, Mar. 30, 1973, 67928/73

Int. Cl.² B29F 1/14

U.S. Cl. 264—295 **1 Claim**



1. A method of injection molding a monolithic tubular closure device for cans or similar containers, said device having an upper cylindrical portion with a flange extending radially therefrom, a lid frangibly molded to the upper cylindrical portion, a lower widened portion attached to the upper cylindrical by a thin walled portion, said lower widened portion having an annular ridge formed adjacent its base, in a molding apparatus having an upper plate, a plurality of radially displaceable wall elements, a base plate and a movable, shaped core, said method comprising the steps of:

a. moving the radially displaceable wall elements inwardly adjacent said upper plate and said base plate so as to define a cavity having the contours of the outer surface of said closure device;

b. inserting said shaped core into said cavity to define the inner surface of said closure device;

c. injecting a flexible plastic material into said cavity to form said closure device;

d. attaching the formed device to said shaped core;

e. retracting said upper plate away from said molded closure device;

f. moving the radially displaceable wall elements in a radially outward direction so as to disengage the molded closure device;

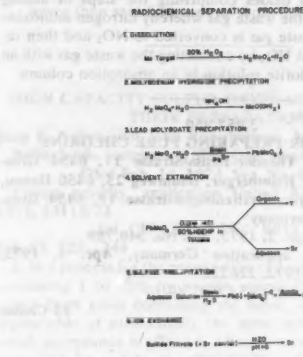
g. retracting said shaped core so as to retract the upper cylindrical portion of said closure device within the lower widened portion; and

h. detaching said closure device from said shaped core by further retraction of said shaped core such that said radially extending flange contacts said annular ridge to prevent further retraction to the upper cylindrical portion into the lower widened portion, the flexibility of the plastic material allowing the shaped core to detach itself from the closure device.

3,957,945
CHEMICAL ISOLATION OF ^{82}SR FROM PROTON-IRRADIATED Mo TARGETS

Patrick M. Grant, Los Alamos; Milton Kahn, Albuquerque, and Harold A. O'Brien, Jr., Los Alamos, all of N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 21, 1974, Ser. No. 499,222
Int. Cl.² B01J *1/10*; C22B *26/20*; C01F *11/16*
U.S. Cl. 423—2 **1 Claim**



1. A method of chemically isolating ^{82}Sr from proton-irradiated Mo targets comprising:

a. dissolving the Mo metal target containing the ^{82}Sr,

b. making basic the dissolved Mo target solution, removing the precipitate from the mother liquid,

c. adding Pb to the separated mother liquid to form a lead-molybdate-^{82}Sr precipitate,

d. dissolving the lead-molybdate-^{82}Sr precipitate by the addition of a mixture of hydrochloric acid and bis-(2-ethyl-hexyl) phosphoric acid in toluene which forms both an aqueous and organic phase in said solution,

e. making basic the aqueous phase of said solution, bubbling hydrogen sulfide through the aqueous phase until the lead is precipitated, adding sufficient acid to cause the molybdenum to precipitate, and

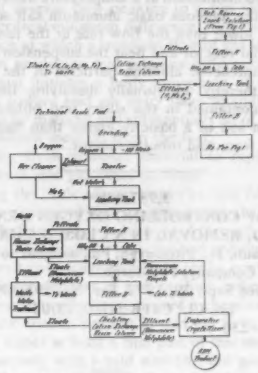
f. adjusting the pH of the resulting ^{82}Sr-containing filtrate to about 6.0 and passing said filtrate through an ion exchange column consisting of hydrous zirconium oxide which absorbs all impurities and allows only the radioactive strontium to pass.

3,957,946
MOLYBDENUM OXIDE PURIFICATION PROCESS

Richard A. Ronzio, Golden; Robert C. Ziegler, Lakewood; Fred N. Oberg, Arvarda, and R. Stanley Rickard, Lakewood, all of Colo., assignors to Amax Inc., New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,671
Int. Cl.² C01G *39/00*
U.S. Cl. 423—56 **17 Claims**

1. A process for producing a high purity molybdenum-containing product which comprises the steps of providing an impure concentrate of molybdenum oxide, reducing the average particle size of said concentrate to less than about 100 mesh, roasting the said concentrate at an elevated temperature ranging from about 550°C to about 650°C in an oxygen atmosphere containing at least 40% oxygen to convert suboxides of molybdenum to molybdenum trioxide and contaminating metal molybdite compounds to metal molybdate compounds, leaching the roasted said concentrate with hot water at a solids concentration of from about 5% up to about 50% to extract the aqueous soluble metal molybdate compounds therefrom, separating the aqueous leached said concentrate from the aqueous leach solution, contacting said aqueous leach solution with an ion exchange resin to separate the solubilized contaminating metal cations from the solubilized molybdate anions and recovering said molybdate anions, leaching the aqueous leached said concentrate with an ammoniacal leach solution to solubilize the molybdenum trioxide therein as ammonium molybdate compounds, separating said ammoniacal leach solution from the remaining insoluble residue and discarding the latter, contacting the separated said ammoniacal leach solution with a chelating cation exchange resin and adsorbing additional residual contaminating metal ions remaining as ammine complexes, and thereafter recovering the ammonium molybdate compounds from said ammoniacal leach solution as a purified product.

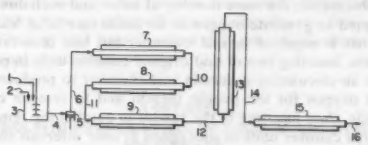


11. The process as defined in claim 10, wherein said sulfide compound comprises ammonium sulfide and said contaminating metal comprises predominantly copper to form an insoluble copper sulfide precipitate which is removed and discarded with said insoluble residue.

3,957,947
PROCESS FOR CONTINUOUS PRODUCTION OF AQUEOUS BASIC ALUMINUM SALT SOLUTIONS

Koichi Yamada; Masao Yoshihara, and Hisakatsu Kato, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 25, 1974, Ser. No. 445,605
Claims priority, application Japan, Feb. 26, 1973, 48-23523; Feb. 26, 1973, 48-23524
Int. Cl.² C01F *7/00*, *7/56*, *7/66*
U.S. Cl. 423—111 **12 Claims**



1. A process for continuously producing a basic aluminum salt comprising

passing (A) a slurry consisting of (1) an alumina selected from the group consisting of aluminum hydroxide, an alumina-containing mineral and a mixture thereof, and (2) a mineral acid selected from the group consisting of hydrochloric acid and nitric acid, or (B) a slurry resulting

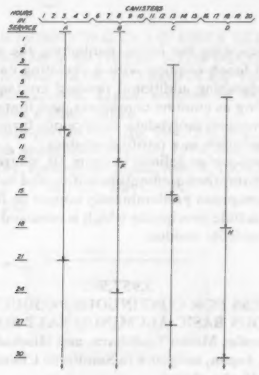
from the preliminary reaction of said slurry at a temperature of from normal temperature to the boiling point of an aqueous basic aluminum salt solution, through an indirectly heated tubular reactor maintained at a temperature of at least about 120°C at a flow rate such that solid material in the slurry is not settled, and then

passing the slurry of basic aluminum salt of low basicity synthesized in the tubular reactor, said slurry containing unreacted alumina particles, through a holding treatment device having a larger inner diameter than said tubular reactor, the holding treatment device being indirectly heated and maintained at a temperature above the boiling point of the aqueous basic aluminum salt solution, at a flow rate lower than the flow rate at the feeding part of said tubular reactor and near the suspension limit rate to prevent unreacted alumina particles in the slurry from settling, thereby additionally dissolving the unreacted alumina contained in the slurry and obtaining a basic aluminum salt of a basicity higher than that of the salt obtained from said tubular reactor.

3,957,948
METHOD OF CONTROLLING OXYGEN GENERATION AND CO_2 REMOVAL IN A CLOSED CHAMBER

Charles H. Staub, Jr., Pittsburgh, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Sept. 29, 1972, Ser. No. 293,309
Int. Cl.² C01B *31/20*, *13/02*
U.S. Cl. 423—230 **4 Claims**



1. The method of controlling the rate of oxygen generation in a closed chamber in accordance with the metabolic requirements of people therein, comprising providing a plurality of original air purifying-oxygen generating canister units and replacement canister units, all of said units having a useful life of substantially the same number of hours and each unit being designed to generate oxygen at an initial rate of at least half of what is required in said chamber but less than required therein, inserting two of said original canister units in parallel in an air-circulating system in said chamber to produce sufficient oxygen for the people therein and to remove carbon dioxide, then inserting in the system in parallel the remaining original canister units in succession at time intervals substantially equal to said number of hours divided by the number of said original units, replacing one of said two original units with one of said replacement units at a time before the expiration of said number of hours substantially equal to one of said time intervals, and then replacing with said replacement units each of the remaining original units in succession at substantially regular intervals just before the expiration of the life of the unit being replaced.

3,957,949
PROCESS FOR REMOVING NITROGEN OXIDES FROM GAS

Teizo Senjo, Machida, and Makio Kobayashi, Toyonaka, both of Japan, assignors to Fuji Kasui Engineering Co., Ltd., Tokyo and Sumitomo Metal Industries, Ltd., Osaka, both of, Japan

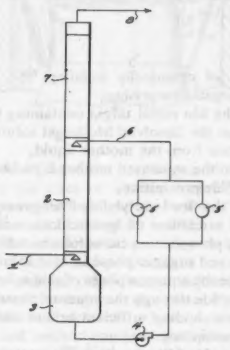
Filed Apr. 2, 1974, Ser. No. 457,208
Claims priority, application Japan, Apr. 10, 1973, 48-40052
Int. Cl.² B01D *53/34*
U.S. Cl. 423—235 **9 Claims**

1. A process for removing nitrogen oxides from waste gas containing nitrogen oxides comprising the steps of adding chlorine dioxide to the waste gas whereby nitrogen monoxide contained in the waste gas is converted to NO_2 and then removing the resultant NO_2 by contacting the waste gas with an aqueous sodium chlorite solution in an absorption column.

3,957,950
PROCESS FOR PREPARING PURE CHLORINE

Friedhelm Geiger, Theodor-Heuss-Strasse 11, 6454 Grossauheim; Werner Heimberger, Baumweg 25, 6450 Hanau, and Gerd Schreyer, Greifenhagenstrasse 19, 6454 Grossauheim, all of Germany

Filed Apr. 2, 1973, Ser. No. 346,789
Claims priority, application Germany, Apr. 1, 1972, 2215942; Dec. 20, 1972, 2262267
Int. Cl.² C01G *49/10*
U.S. Cl. 423—240 **15 Claims**



1. A process for removing ferric chloride vapor which is present as an impurity in a gas consisting essentially of chlorine and containing said ferric chloride as an impurity comprising passing the chlorine gas through a member of the group consisting of (1) solid adsorbents for ferric chloride which are inert to chlorine, and (2) sulfuric acid.

3,957,951
PROCESS FOR REMOVING CONTAMINANTS FROM HOT WASTE GAS STREAMS

Allan E. Hokanson; Raphael Katzen, both of Cincinnati, Ohio, and Edward F. Button, Greenwich, Conn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 23, 1974, Ser. No. 499,837
Int. Cl.² C01B *17/00*
U.S. Cl. 423—242 **12 Claims**

1. In a process for removing sulfur dioxide and other contaminants from a hot waste gas stream in which the waste gas stream is passed through one or more absorption zones for removal of sulfur dioxide and other contaminants, the absorption zones utilizing as the absorbent a recirculated aqueous

salt solution of ammonium sulfite-bisulfite, the improvement comprising

cooling said waste gas stream to a temperature below about 100°F,

passing said waste gas stream in sequence through at least two separate absorption zones while continuously withdrawing heat from the recirculated salt solution in each zone,

the absorbent in the first lower absorption zone have an initial pH of from 6 to 7.2 and a salt concentration of from 1 to 20% by weight,

the absorbent in the second upper absorption zone having an initial pH of from 5.2 to 6.5 and a salt concentration lower than said first zone of from 0.1 to 5% by weight.

3,957,952

HIGH CAPACITY SULFUR OXIDE-ACCEPTORS AND THEIR PREPARATION

Jaap E. Naber, and John Ramsbotham, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 14, 1974, Ser. No. 442,973

Claims priority, application United Kingdom, Mar. 19, 1973, 13115/73

Int. Cl.² C01B *17/00;* **B01J** *8/00*

U.S. Cl. 423—244 **10 Claims**

1. In a process for the preparation of a regenerable acceptor containing 1 to 15% by weight copper for removing sulfur oxides from gases containing the same, said acceptor being regenerable at substantially the same temperature range at which acceptance is effected, wherein a carrier containing at least 30% by weight alumina is calcined at a temperature above 780° and impregnated with a solution containing cations of one or more of the metals aluminum, magnesium, titanium and zirconium either prior to or simultaneously with the impregnation with a solution containing copper cations, said aluminum, magnesium, titanium and zirconium metals being present in solution at an atomic ratio of from 1:0.5 to 1:5 of the copper present in solution, the improvement which comprises impregnating said carrier with a solution containing cations of one or more alkali metals either subsequent to or simultaneously with the impregnation employing the solution containing aluminum magnesium, titanium and zirconium cations, said alkali metals being impregnated on the carrier in an amount of from 1 to 30% by weight of the prepared acceptor.

3,957,953

TREATING GAS WITH CATALYTIC DUST IN PANEL BED

Arthur M. Squires, 245 W. 104 St., New York, N.Y. 10025

Filed Sept. 19, 1974, Ser. No. 507,385

Int. Cl.² C01B *17/00;* **B01J** *8/00*

U.S. Cl. 423—244 **11 Claims**

1. The method of treating a gas involving its contacting with a fine granular medium catalytic toward a chemical reaction by a chemical species present in the gas, comprising:

a. arranging a granular material smaller than about 20 mesh in a panel bed having a plurality of transversely disposed upwardly spaced gas entry portions separated by interposed supporting members having outer and inner edges with respect to the bed wherein said gas entry portions have gas entry faces substantially contiguous with said outer edges and wherein said bed has gas exit portions spaced from said inner edges;

b. forwardly flowing gas through the gas entry portions of the granular material bed and outwardly from the gas exit portions while adding to said gas a granular medium substantially smaller than about 120 mesh to separate and accumulate said medium in surface layer deposits at said gas entry faces wherein said gas enters said gas entry faces at a velocity greater than about 16 feet per minute during at least a part of this step (b);

c. thereafter causing a transient flow of gas to move in the direction in reverse to the flow of said gas in (b);

d. said transient reverse flow producing first a rise at a given rate of rise and subsequently a fall in the pressure difference between said gas exit portions and said gas entry portions, said difference produced by said transient reverse flow remaining greater than a first critical minimum difference for a time interval of less than about 150 milliseconds, said first critical difference being that difference at which a steady flow of gas in said reverse direction just produces a localized spill of granular material from said gas entry faces, and said difference produced by said transient reverse flow peaking to a top value beyond a second critical minimum difference, which is the pressure difference at which a transient flow of gas in said reverse direction producing said pressure difference at said rate of rise just initiates a body movement of said granular material toward said gas entry faces to spill a portion of the granular material and substantially all of said accumulated granular medium from the bed;

e. supplying fresh granular material to replace material spilled from said gas entry portions;

f. repeating the cycle of said steps (b), (c), (d), and (e) at least two times and then repeating step (b);

g. forwardly flowing gas to be treated through the gas entry portions of the granular material bed and outwardly from the gas exit portions to treat said gas by contact with said surface layer deposits of said medium, wherein said medium is catalytically active toward a chemical reaction by a chemical species present in said gas to be treated, and wherein either at least a first part of this step (g) occurs simultaneously with a said step (b), the gas in (b) comprising the gas to be treated, or this step (g) is wholly subsequent to said step (b); and

h. thereafter repeating steps (c), (d), (e), (b), and (g) in a cyclic manner.

3,957,954

HIGH-TEMPERATURE REACTION METHOD FOR PRODUCING GROUP II-VI OR A GROUP III-V COMPOUND

William Andrew Gault, Ewing Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Oct. 30, 1974, Ser. No. 519,482

Int. Cl.² C01B *25/00, 19/00, 17/00*

U.S. Cl. 423—299 **6 Claims**

1. A method of reacting a first reactant and a second reactant to form a Group II-VI or a Group III-V compound, comprising:

coupling the first reactant at a reaction site to an induction coil with a first efficiency;

heating the second reactant;

inductively heating the first reactant to react with the second reactant at the site to form a mixture comprising the reaction product and both reactants;

heating said mixture at the site with an efficiency varying from said first efficiency to a second efficiency having a constant value as the reaction proceeds to completion;

monitoring the coupling efficiency during the reaction; and

terminating said heating when said second constant efficiency is attained.

3,957,955

PROCESS FOR PREPARATION OF SODIUM AMMONIUM PHOSPHATE

Bernard H. Nicolaisen, Houston, Tex., assignor to Olin Corporation, New Haven, Conn.

Filed Dec. 30, 1974, Ser. No. 537,235

Int. Cl.² C01B *15/16, 25/26*

U.S. Cl. 423—312 **4 Claims**

1. A process for preparing a solution of sodium ammonium phosphate and carbon dioxide which comprises:

a. introducing aqueous monoammonium phosphate into a substantially vertical column provided with vapor-liquid contact means,
b. introducing aqueous sodium carbonate into said column at a level below that at which said monoammonium phosphate is introduced at a rate sufficient to maintain in said column a Na/P molar ratio in the range of 0.5-1.5,
c. permitting said monoammonium phosphate to flow downwardly into continuous co-current contact and react with said sodium carbonate at a temperature of 125-250°F., and
d. removing from said column an overhead product comprising substantially ammonia-free carbon dioxide and simultaneously recovering a bottoms product comprising a solution of sodium ammonium phosphate having a reduced carbon dioxide level.

3,957,956

CLOSED CYCLE ION EXCHANGE METHOD FOR REGENERATING ACIDS, BASES AND SALTS

Robert M. Dreyfuss, Livermore, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 20, 1974, Ser. No. 481,300
Int. Cl.[2] C01B 21/40
U.S. Cl. 423—394 10 Claims

1. In a closed cycle method for hydrolyzing an intermetallic compound of a metal and a metalloid selected from the group consisting of arsenic, antimony, bismuth, selenium, and tellurium, the steps comprising:
a. adding sufficient acid to the hydrolysis reaction mixture to maintain the pH thereof at a level effective for hydrolysis, the acid thereby becoming spent as a consequence of the formation of the corresponding salt of the metal and the acid, said acid being characterized by an anion capable of forming with the cation of a cation exchange resin in a subsequent cation exchange step a compound thermally decomposable into the acid and a substance capable of providing the cation of the cation exchange resin;
b. contacting the spent acid with the cation exchange resin, thereby forming said thermally decomposable compound and the cation exchange resin thereby becoming spent;
c. thermally decomposing said thermally decomposable compound into the acid and the substance capable of providing the cation of the cation exchange resin; and
d. contacting the spent cation exchange resin from step b with the cations provided by the thermal decomposition step, thereby regenerating the cation exchange resin.

3,957,957

METHOD FOR PREPARING GRAPHITE ARTICLES

John W. Newman, Ashland, and Charles D. Hoertz, Jr., Bellefonte, both of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed May 30, 1974, Ser. No. 474,637
Int. Cl.[2] C01B 31/04
U.S. Cl. 423—448 8 Claims

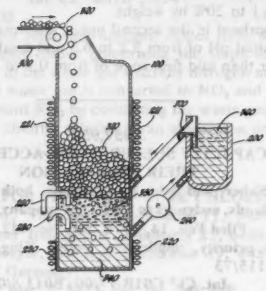
1. A method for making a graphite article comprising:
a. converting a first portion of a thermal unoxidized petroleum pitch to a particulated petroleum coke;
b. mixing with the particulated petroleum coke of (a) a second portion of the thermal unoxidized petroleum pitch of (a) to form a moldable paste;
c. molding the resulting paste of (b) into an article of a desired shape;
d. baking the article of (c) until the volatile components of said pitch have been vaporized;
e. impregnating said baked article of (d) with a third portion of the thermal unoxidized petroleum pitch of (a); and
f. heating the resulting impregnated baked article of (e) to a temperature of at least 2200°C thereby converting said article to graphite.

3,957,958

CARBON PURIFICATION PROCESS

Seymour Katz, Southfield, and Michael M. Shea, Mt. Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 21, 1975, Ser. No. 542,664
Int. Cl.[2] C10B 57/00
U.S. Cl. 423—461 5 Claims



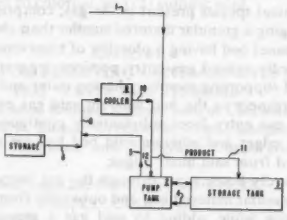
1. A method of forming a low-sulfur carbon raiser comprising:
a. dissolving a sulfur-containing carbonaceous material selected from the group consisting of coal and coke in molten iron in such proportions to provide a carbon concentration in said melt in the range of from about 3½% to about 6½% by weight;
b. removing any undissolved material;
c. cooling said melt to precipitate said carbon which floats to the surface forming a recoverable constituent which may also contain iron;
d. removing said carbon-containing constituent from the surface of said melt;
e. repeating steps (a) through (d) using said iron melt; and
f. maintaining a sulfur concentration in said iron melt below about ½% by weight by periodically precipitating sulfur from the melt with a desulfurization agent and removing the precipitate from the melt.

3,957,959

PROCESS FOR PRODUCING FLUOSULFONIC ACID

Roger Warren Wheatley, Ogden Dunes; Duane Eugene Treadway, Crown Point, and Ralf Gerrit Toennies, Lowell, all of Ind., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 7, 1974, Ser. No. 521,918
Int. Cl.[2] C01B 17/45, 17/46
U.S. Cl. 423—467 7 Claims



1. A process for producing fluosulfonic acid comprising the steps of (1) adding liquid SO_3 and anhydrous liquid HF separately to a stream of fluosulfonic acid to form additional fluosulfonic acid, (2) cooling the fluosulfonic acid and (3) recy-

cling fluosulfonic acid to step (1) at a rate about 10 to 100 times greater than the rate of formation of fluosulfonic acid; said SO_3 and HF being added to fluosulfonic acid in step (1) in controlled proportions to maintain constant the density of the resulting product measured at constant temperature and with an essentially constant impurity content in the starting materials.

3,957,960

METHOD FOR RECOVERING SULFUR FROM AMMONIA-CONTAINING ACID GAS STREAMS

John W. Palm, and Kay L. Berry, both of Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.

Division of Ser. No. 335,615, Feb. 26, 1973, Pat. No. 3,877,879. This application Dec. 23, 1974, Ser. No. 535,778

Int. Cl.² C01B *17/04*

U.S. Cl. 423—573 G **7 Claims**

1. In a process for the recovery of free sulfur from dual H_2S-containing feed streams, one of which streams contains ammonia, the latter stream having been derived by first reacting with hydrogen a liquid hydrocarbon containing nitrogen compounds and sulfur compounds, scrubbing the resulting product gases with water to produce an aqueous solution of ammonia and H_2S and liberating the H_2S and ammonia from said solution by steam stripping or the equivalent to form a mixture of ammonia and H_2S, the improvement comprising burning of said streams in separate conbustion zones, the ammonia-containing stream being burned using an excess of air over that required to give an H_2S/SO_2 ratio of 2:1 while the ammonia-free stream is burned with a deficiency of air under that required to give an H_2S/SO_2 ratio of 2:1, sampling the combustion products produced by the burning of said ammonia-containing stream to determine the H_2S/So_2 ratio therein, maintaining the air supply in the burning of the ammonia-containing stream in an amount sufficient to produce an H_2S/SO_2 ratio in said combustion products ranging from about 0.085 to less than 2.0, adjusting the overall air supply to the process so as to maintain an H_2S/SO_2 ratio in the plant effluent of about 2:1, and discharging the combustion products from both of said zones into a boiler.

3,957,961

PROCESS FOR THE PRODUCTION OF HYDROGEN/DEUTERIUM-CONTAINING GAS

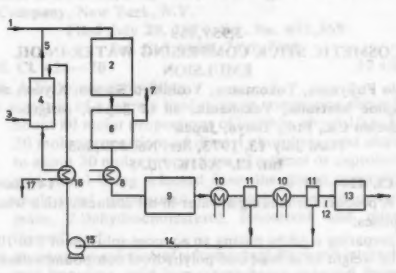
Eberhard Nitschke, Do-Barop; Arvind Desai, Dortmund-Aplerbeck, and Hartmut Ilgner, Dortmund, all of Germany, assignors to Friedrich Uhde GmbH, Dortmund, Germany

Filed Apr. 19, 1973, Ser. No. 352,606

Claims priority, application Germany, May 29, 1972, 2226065

Int. Cl.² C01B *4/00, 1/16, 1/26*

U.S. Cl. 423—650 **3 Claims**



1. A process for the production of manufactured hydrogen gas rich in naturally occurring deuterium by a method comprising in sequence the steps of:

I. reacting hydrocarbons, oxygen and steam in an elevated temperature zone to produce a process gas which contains carbon monoxide, water vapor, and hydrogen;

II. passing the process gas through a carbon monoxide converter zone to change the carbon monoxide to carbon dioxide which gives a modified process gas which consists of carbon dioxide, water vapor and hydrogen;

III. cooling the modified process gas to achieve a gaseous component which consists of carbon dioxide, hydrogen and residual water vapor and a condensate which is water with some carbon dioxide and impurities dissolved in it;

IV. separating the two phases in a separation zone;

V. conveying the condensate to the top of an exchange column;

VI. introducing steam into the bottom of the exchange column;

VII. contacting the condensate with the steam in the exchange column employing countercurrent mass transfer to achieve an equilibrium of concentration of deuterium, the deuterium in the condensate equilibrates to the steam which enriches the steam in deuterium and depletes the water of deuterium thereby producing steam rich in deuterium;

VIII. conveying the steam rich in deuterium to Step I.

IX. conducting the gaseous component of Step III to a carbon dioxide scrubbing zone;

X. removing the carbon dioxide from the gaseous component leaving manufactured hydrogen gas rich in naturally occurring deuterium.

3,957,962

PROCESS FOR THE PREPARATION OF HYDROGEN-RICH GAS

John Ramsbotham, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 22, 1974, Ser. No. 453,753

Claims priority, application Netherlands, Apr. 17, 1973, 7305340

Int. Cl.² C01B *1/08, 31/20, 2/10, 1/03*

U.S. Cl. 423—655 **19 Claims**

1. A process for the preparation of a hydrogen-rich gas by converting a gas mixture including carbon monoxide and steam, comprising contacting said mixture at reaction conditions and a temperature between 175°C and 425°C and a pressure between 10 and 100 bar with a sulfided catalyst which comprises nickel and/or cobalt, molybdenum and 0.1–1.0 parts by weight of impregnated aluminum per part by weight of nickel and/or cobalt, all supported on an alumina carrier in an amount of 1–20 parts by weight of nickel and/or cobalt per 100 parts of alumina and the atomic ratio of nickel and/or cobalt to molybdenum is from 0.05 to 3.0, which catalyst is prepared by impregnating the carrier with one or more solutions of compounds of nickel and/or cobalt, molybdenum and aluminum in which at least 40% by weight of the aluminum is supported on the carrier by co-impregnation with the nickel and/or cobalt followed by drying and calcining the impregnated carrier.

3,957,963

RADIOIODINATED BLEOMYCIN

Sidney E. Salmon, and Rosa H. Liu, both of Tucson, Ariz., assignors to University Patents, Inc., Stamford, Conn.

Filed Dec. 3, 1974, Ser. No. 529,237

Int. Cl.² A61K *43/00*

U.S. Cl. 424—1 **7 Claims**

1. Radioiodinated bleomycin, wherein the radioiodine is selected from the group consisting of I^{123}, I^{125} and I^{131}

3,957,964

DENTIFRICE CONTAINING ENCAPSULATED FLAVORING

John Edward Grimm, III, New York, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 438,028, Jan. 30, 1974, abandoned, which is a continuation of Ser. No. 235,038, March 15, 1972, abandoned. This application June 3, 1975, Ser. No. 583,380

Int. Cl.[2] A61K 7/16

U.S. Cl. 424—10 19 Claims

1. A dentifrice adapted to release a plural flavor burst signalling the onset of and the completion of a toothbrushing operation, respectively, comprising essential oils of distinctive non-minty flavor in thin walled microcapsules producing a distinctive initial non-minty flavor during early brushing of the teeth, and essential oils of mint flavor in a thicker walled microcapsule than said thinner walled microcapsule and producing a mint flavor subsequent to said non-mint flavor and signalling the onset of the completion of the brushing operation, said nonminty flavor released initially from said thin walled microcapsules when said dentifrice is extruded from a container by shearing contact with the container neck wall and by rupture on contact with the teeth, the mint flavor in said thicker walled microcapsules being adapted to signal the onset of completion of said brushing operation by being ruptured during the course of brushing the teeth, said flavors encapsulated by 30% of the total capsule weight in a water insoluble, film forming synthetic organic polymeric plastic having an equivalent diameter of about one micron to 2 millimeters and having a wall thickness of about 0.1 micron to 2 millimeters, included in a concentration of about 0.1 to 10% into an unflavored dentifrice having a viscosity of under about 40,000 cps.

3,957,965

SODIUM CHROMOGLYCATE INHALATION MEDICAMENT

Philip Saxton Hartley, Kegworth, and Stephen Raymond Gunning, East Leake, near Loughborough, both of England, assignors to Fisons Limited, London, England

Division of Ser. No. 158,059, June 29, 1971, Pat. No. 3,860,618, which is a continuation-in-part of Ser. No. 748,937, July 31, 1968, Pat. No. 3,634,582. This application Sept. 27, 1973, Ser. No. 401,251

Claims priority, application United Kingdom, Aug. 8, 1967, 36270/67

Int. Cl.[2] A61J 3/00, 3/10; A61K 9/00

U.S. Cl. 424—14 7 Claims

1. A pharmaceutical dosage unit which comprises a pierceable capsule containing a powder composition for inhalation which consists essentially of a heterogeneous particle size readily fluidizable mixture of sodium chromoglycate having an effective particle size in the range 0.01 to 10 microns and a solid pharmaceutically acceptable water-soluble inhalation powder carrier having an effective, coarser particle size in the range of 30 to 80 microns the powder composition containing from 10% to 75% by weight of sodium chromoglycate and from 90% to 25% by weight of said carrier.

3,957,966

STABILIZED VITAMIN FOOD COATINGS

Kent John Valan, Northampton, Pa., assignor to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 254,897, May 19, 1972, abandoned. This application Mar. 10, 1975, Ser. No. 556,972

Int. Cl.[2] A61K 9/32, 9/42, 9/58

U.S. Cl. 424—33 25 Claims

1. A food-fortification, odor and taste masking, vitamin-stabilizing melt emulsion coating composition comprising approximately by weight (a) about 40 parts to 80 parts of a polymer, said polymer consisting essentialy of (1) a homopolymer of N-vinylpyrrolidone or (2) a copolymer of said N-vinylpyrrolidone with up to about 70 percent vinyl acetate based upon the weight of said copolymer; said homopolymer or copolymer having a K value of about 10 to 100; and (b) in complex combination with about 70 parts to 30 parts of a plasticizer which is stearyl alcohol, partially acetylated monoglyceride, stearic acid, isostearic acid, oleic acid, 1-octadecanol, linoleic acid or linolenic acid; and (c) about 0.5 to 50 parts of a vitamin thereby having extended shelf life imparted thereto, said vitamin otherwise adversely afeected by light, moisture, oxygen, or temperature of the environment, said vitamin being selected from the group consisting of vitamins A, B_1, B_2, B_{12}, C and E.

3,957,967

AGENT FOR THE CARE AND THE CLEANING OF TEETH AND DENTURES

Paul L'Orange, Mainz, Germany, assignor to Blendax-Werke R. Schneider & Co., Mainz, Germany

Filed July 1, 1974, Ser. No. 484,685

Claims priority, application Germany, July 27, 1973, 2338177

Int. Cl.[2] A61K 7/22, 7/30

U.S. Cl. 424—48 10 Claims

1. A dental care composition comprising 1,6-di-4'-chlorophenyldiguanidohexane or the non-toxic salts thereof in an amount of between about 0.01 and about 25 percent by weight of the composition based on free 1,6-di-4'-chlorophenyldiguanidohexane and urea, the amount of urea being sufficient to reduce the tendency of the 1,6-di-4'-chlorophenyldiguanidohexane or salts thereof to cause discoloration of the teeth, tongue or dentures and in an amount of between about 5.0 and about 45 percent by weight of the composition.

3,957,968

DENTIFRICES CONTAINING FLAT FLAKES OF ALPHA-ALUMINA

Martin Cordon, Highland Park, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 389,826, Aug. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 355,365, April 30, 1973, abandoned. This application Mar. 25, 1975, Ser. No. 561,842

Int. Cl.[2] A61K 7/16

U.S. Cl. 424—57 9 Claims

1. A dentifrice comprising, as an abrasive, alpha-alumina which is in the form of flakes having an average diameter of less than 20 microns and thicknesses of less than about 3 microns, the proportion of said alpha-alumina being above 0.1% and less than 60%.

3,957,969

COSMETIC STICK COMPRISING WATER-IN-OIL EMULSION

Yoshio Fujiyama, Yokomama; Yoshihiro Kanda, Kiyose, and Hajime Matsuda, Yokohama, all of Japan, assignors to Shiseido Co., Ltd., Tokyo, Japan

Filed July 13, 1973, Ser. No. 379,063

Int. Cl.[2] A61K 7/025

U.S. Cl. 424—64 14 Claims

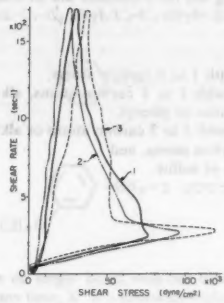
1. A process for making a water-in-oil cosmetic stick which comprises:

a. preparing a gel by mixing an aqueous solution of 1 to 10% by weight of at least one polyhydroxl compound selected from the group consisting of glycerol, mannitol and carbohydrates and 1 to 5% by weight of at least one nonionic surface active agent selected from oleic acid esters of polyhydric alcohols;

b. mixing said gel with a predetermined quantity of at least

20% by weight of at least one cosmetic base material; and

c. mixing from 1 to 50% by weight of water into said cosmetic base material-gel mixture whereby the water is uniformly emulsified into said mixture.



3,957,970

SHAMPOO CONTAINING AN ESTER OF POLYETHYLENE GLYCOL, UREA OR THIOUREA AND A POLYSILOXANE

George N. Korkis, Paramus, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed June 6, 1974, Ser. No. 476,977

Int. Cl.² A61K *7/06*

U.S. Cl. 424—70 **5 Claims**

1. In a shampoo composition comprising an aqueous carrier, a mixture comprising 50 to 60 percent by weight of a soap and 40 to 60 percent by weight of a synthetic detergent, the improvement which comprises the addition thereto of a composition, based upon the total weight of shampoo composition, consisting essentially of, (a) from about 0.1 to 5 percent by weight of either a mono or diester of polyethylene glycol having a molecular weight of from about 400 to 6000; (b) from about 0.1 to 5 percent by weight of urea or thiourea; and, (c) from about 1 to 4 percent by weight of a liquid copolymer of an alkylene glycol and dimethyl siloxane.

3,957,971

MOISTURIZING UNITS AND MOISTURIZING COMPOSITIONS CONTAINING THE SAME

Walter S. Oleniacz, Ringwood, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed July 29, 1974, Ser. No. 492,369

Int. Cl.² A61K *7/06, 7/48*

U.S. Cl. 424—70 **17 Claims**

1. A liposome comprising

i. a matrix of a ternary lipid mixture comprising about 50 to about 80 molar proportions of lecithin; about 10 to about 30 molar proportions of dicetyl phosphate; and about 10 to about 30 molar proportions of a sterol or caprolactum, said sterol being selected from the group consisting of cholesterol, phytosterol, sitosterol, sitosterol pyroglutamate, 7-dehydrocholesterol, lanosterol and mixtures thereof; and

ii. an aqueous solution of a humectant disposed interiorly of said liposome, said humectant being selected from the group consisting of glycerol, urea, sodium pyroglutamate, ornithine, and the Spier-Pascher water solubles;

said liposome having a substantially continuous outer surface.

3,957,972

STABLE SOLUTIONS OF OXYTETRACYCLINE SUITABLE FOR PARENTERAL AND PERORAL ADMINISTRATION AND PROCESS OF PREPARATION

Hubert Antonius Weber, deceased, late of Delft, Netherlands (by Elsa Mathilda Weber nee van den Dorpel, administrator), and Adrianus Pieter Molenaar, Delft, Netherlands, assignors to Koninklijke Nederlandsche Gist-en Spiritusfabriek N.V., Delft, Netherlands

Continuation-in-part of Ser. No. 78,178, Oct. 5, 1970, abandoned, which is a continuation-in-part of Ser. No. 641,483, May 26, 1967, Pat. No. 3,557,280. This application June 28, 1972, Ser. No. 267,087

Claims priority, application Netherlands, May 31, 1966, 6607516

The portion of the term of this patent subsequent to Jan. 19, 1988, has been disclaimed.

Int. Cl.² A61K *31/65, 31/79*

U.S. Cl. 424—80 **3 Claims**

1. A clear, stable, aqueous solution of oxytetracycline for medical applications consisting essentially of from 1% to 5% by weight of oxytetracycline and water containing polyvinyl pyrrolidone having a molecular weight in the range of 3,000 to 60,000 and a magnesium compound capable of supplying magnesium ions, said aqueous solution having a pH in the range of from 8.0 to 9.5 and a concentration of polyvinyl pyrrolidone of from 2.5 to 7.49%, the amount of said magnesium compound being selected so that essentially all of the magnesium ions are complexed by the oxytetracycline.

3,957,973

COMPOSITION AND METHOD FOR GASTRIC ULCER-PREVENTION AND PICA-PREVENTION OF SWINE

Masahide Yamaguchi, Tochigi, and Kanemichi Sasaki, Kasukabe, both of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo and Glico Chikusan Kabushiki Kaisha, Kuroiso, both of, Japan

Continuation-in-part of Ser. No. 320,850, Jan. 4, 1973, abandoned. This application July 19, 1974, Ser. No. 490,089

Claims priority, application Japan, Jan. 14, 1972, 47-6475; June 20, 1972, 47-61683

Int. Cl.² A61K *31/78*

U.S. Cl. 424—81 **3 Claims**

1. A method of preventing gastric ulcer and tail-biting in swine comprising continuously or repeatedly feeding to said swine an effective amount of sodium polyacrylate or potassium polyacrylate having an average polymerization degree of not less than 15,000.

3,957,974

METHOD FOR DEODORIZATION OF EXCREMENTS

Kosei Hata, Osaka, Japan, assignor to Seikenkai, Japan

Filed Nov. 5, 1974, Ser. No. 521,190

Int. Cl.² A61K *35/74*

U.S. Cl. 424—93 **7 Claims**

1. A method for deodorization of excrements of human beings or animals which comprises administering to said human beings or animals the living cells of a microorganism selected from the group consisting of:

a. Lactobacillus F.R.I. Strain No. 1946;

b. Lactobacillus F.R.I. Strain No. 2779,

c. Lactobacillus F.R.I. Strain No. 2780,

d. Lactobacillus F.R.I. Strain No. 2781 and

e. Lactobacillus F.R.I. Strain No. 2782.

3,957,975
USE OF THE PREGNANCY-SPECIFIC β_1-GLYCO-PROTEIN AND ITS ANTIBODY FOR CONTRACEPTION

Hans Bohn, Marbach, near Marburg an der Lahn, and Ernst Weinmann, Michelbach,near Marburg an der Lahn, both of Germany, assignors to Behringwerke Aktiengesellschaft, Frankfurt an der Lahn, Germany

Filed Sept. 10, 1974, Ser. No. 504,700

Claims priority, application Germany, Sept. 12, 1973, 2345953

Int. Cl.² A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 **1 Claim**

1. Process for contraception or for inducing of miscarriages in primates which comprises parenterally administering to a primate an effective amount of an aqueous dispersion of the pregnancy-specific β_1-glycoprotein.

3,957,976
METHODS FOR REDUCING CHOLESTEROL LEVELS

Kaname Sugimoto, Okayama, Japan, assignor to Kabushiki-Kaisha Hayashibara Seibutsukagaku Kenkyujo, Okayama, Japan

Filed Sept. 20, 1973, Ser. No. 399,096

Claims priority, application Japan, Sept. 29, 1972, 47-97198

Int. Cl.² A61K *31/70*

U.S. Cl. 424—180 **6 Claims**

1. A method for lowering the cholesterol absorbance of a person in need of such treatment comprising feeding to said person a cholesterol-containing food or drink in which maltitol ot lactitol is present in an amount sufficient to inhibit the absorbance of cholesterol in the human body, thereby inhibiting the increase in the blood and liver cholesterol levels in said person caused by the cholesterol in said food or drink being fed.

3. A method for inhibiting the increase in blood and liver cholesterol levels incurred upon the ingestion of sucrose in a person with a disease induced or aggrevated by excess blood cholesterol or liver cholesterol levels comprising feeding to said person a food or drink in which maltitol or lactitol is present, in addition to sucrose, in an amount sufficient to inhibit the absorbance of sucrose in the digestive tract, thereby inhibiting the blood or liver cholesterol level increases caused by such sucrose.

3,957,977
O-ALKYL-O-[3-METHYL-1,2,4-TRIAZOLO-(2,3,B)-THIAZOL(6)-YL](THIONO)-PHOSPHORIC (PHOSPHONIC) ACID ESTERS

Hellmut Hoffmann, Wuppertal; Ingeborg Hammann, Cologne; Wolfgang Behrenz, Overath-Steinenbruck, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

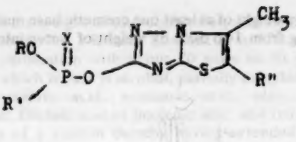
Filed Dec. 9, 1974, Ser. No. 531,025

Claims priority, application Germany, Dec. 10, 1973, 2361451

Int. Cl.² C07D *513/04*

U.S. Cl. 424—200 **12 Claims**

1. An O-alkyl-O-[3-methyl-1,2,4-triazolo-(2,3-b)-thiazol(6)-yl]-(thiono)-phosphoric(phosphoric) acid ester of the formula



in which

R is alkyl with 1 to 6 carbon atoms,

R′ is alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 6 carbon atoms or phenyl,

R″ is alkyl with 1 to 3 carbon atoms or alkylmercapto with 1 to 3 carbon atoms, and

X is oxygen or sulfur.

3,957,978
PHOSPHONIUM ANTI-PARASITICS

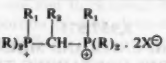
William Henry Gastrock, Hightstown; John Anthony Pankavich, Hamilton Square, and Spencer Douglas Carter, Trenton, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 14, 1975, Ser. No. 550,064

Int. Cl.² A61K *31/66*

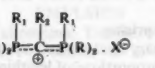
U.S. Cl. 424—204 **19 Claims**

1. A method for controlling helminths in a domestic and farm animal comprising administering orally, subcutaneously or intraruminally to said animal an anthelmintically effective amount of a phosphonium compound having a formula selected from the group consisting of:



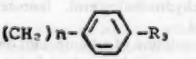
(I)

and

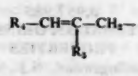


(II)

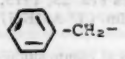
wherein R is phenyl; R_1 is the radical



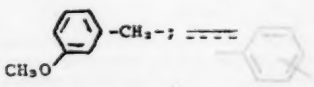
where n is 0 or 1, R_3 is hydrogen or C_1-C_3 alkyl; R_2 is a member selected from the group consisting of hydrogen, halogen, C_1-C_6 alkyl, and



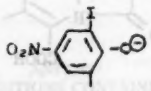
where R_4 and R_5 are selected from the group consisting of hydrogen, C_1–C_3 alkyl, C_1–C_4 alkyl—S—CH_2—,



and



is a double or single bond, only one double bond being present at any time; X^- is a pharmacologically acceptable anion selected from the group consisting of acetate, propionate, gluconate, pamoate, phosphate, $Cl^\ominus$ $Br^\ominus$ $I^\ominus$



$Br^\ominus$ $FeCl_3$, and $Br^\ominus$ $CuBr_2$.

3,957,979
PESTICIDAL N-(O-S-DIALKYL(THIONO)-THIOLPHOSPHORYL)-IMINOFORMIC ACID ALKYL ESTERS

Hellmut Hoffmann, Wuppertal-Elberfeld, and Ingeborg Hammann, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

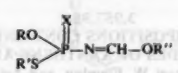
Division of Ser. No. 240,282, March 21, 1972, Pat. No. 3,903,207. This application Feb. 27, 1975, Ser. No. 553,873

Claims priority, application Germany, Apr. 6, 1971, 2116690

Int. Cl.² A01N 9/36

U.S. Cl. 424—217 **10 Claims**

1. A method of combating insect or acarid pests which comprises applying to the pests or a habitat thereof an insecticidally or acaricidally effective amount of a compound of the formula



in which

X is oxygen or sulfur, and

R, R′ and R″ each independently is alkyl with 1 to 6 carbon atoms.

3,957,980
DOXYCYCLINE PARENTERAL COMPOSITIONS

Melvin M. Noseworthy, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 301,326, Oct. 26, 1972, abandoned. This application June 10, 1974, Ser. No. 477,703

Int. Cl.² A61K 31/65

U.S. Cl. 424—227 **10 Claims**

1. A parenteral composition which when reconstituted with water forms a doxycycline chelate, said composition comprising a pharmaceutically acceptable acid addition salt of doxycycline, together with about 3 to 8 molar proportions of a water-soluble alkali metal phosphate salt per mole of said acid addition salt of doxycycline, wherein said alkali metal phosphate salt is sodium or potassium orthophosphate, metaphosphate, pyrophosphate, tripolyphosphate or hexametaphosphate and about 3 to 8 molar proportions of a pharmaceutically acceptable water-soluble magnesium salt per mole of said acid addition salt of doxycycline.

3,957,981
PHARMACEUTICAL COMPOSITION COMPRISING VINCAMINE AND ACETYLSALICYCLIC ACID

Armand Amselem, Toulouse, France, assignor to Parcor, Paris, France

Filed Dec. 23, 1974, Ser. No. 536,941

Claims priority, application France, Dec. 28, 1973, 73.46739

Int. Cl.² A61K 31/475, 31/625

U.S. Cl. 424—232 **10 Claims**

1. A pharmaceutical composition comprising 0.005 to 0.050 grams vincamine and 0.50 to 0.500 grams acetylsalicylic acid, the weight ratio of vincamine to said acid being 0.01 to 0.1:1.

3,957,982
METHOD FOR CONTRACEPTION BY THE APPLICATION OF COMBINATION-TYPE SEQUENTIAL PREPARATIONS

Ursula Lachnit-Fixson, Berlin, Germany, and Alan G. Pitchford, High Hurstwood, near Uckfield, England, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Dec. 23, 1974, Ser. No. 535,575

Claims priority, application Germany, Dec. 21, 1973, 2365103

Int. Cl.² A61K 31/56

U.S. Cl. 424—238 **20 Claims**

1. A method of contraception which comprises administering for 21 successive days to a female of child-bearing age a combination of an estrogen and a progestogen, for the first 4–6 days in a low but contraceptively effective daily dosage corresponding in estrogenic activity to 0.020–0.050 mg. of 17α-ethinylestradiol and in progestogenic activity to 0.050–0.125 mg. of d-norgestrel; for the next 4–6 days, at an estrogen daily dosage from 1–2 times the initial daily low dosage and at a progestogen daily dosage of from 1–1.5 times the dosage of the first 4–6 days; and for the next 9–11 days, at a daily estrogen dosage of from the initial daily dosage to the subsequent daily dosage and at a progestogen daily dosage higher than the previous daily dosages of up to 3 times that of the first daily dosage and corresponding in progestogenic activity to 0.100–0.250 mg. of d-norgestrel, followed by about 7 days without progestogen and estrogen administration.

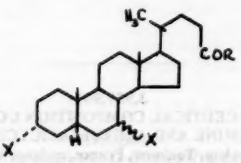
3,957,983

PREVENTION OF TOXICITY ACCOMPANYING ADMINISTRATION OF 3,7-DISUBSTITUTED BILE ACIDS

William H. Saltzman, New Rochelle, N.Y., assignor to Intellectual Property Development Corporation, New Rochelle, N.Y.

Filed Mar. 12, 1975, Ser. No. 557,685
Int. Cl.² A61K *31/56*, *31/575*
U.S. Cl. 424—240 8 Claims

1. A method for reducing or preventing toxicity in mammals which comprises administering to said mammal a small but effective amount of an antibiotic effective against gram-positive or gram-variable microorganisms either prior to or concurrently with the administration to said mammal of a compound of the formula:



wherein each X is selected from the group consisting of hydroxy, acyloxy, alkoxy or oxo (O=), and R is selected from the group consisting of hydroxy, acyloxy, alkoxy, taurine or glycine, and the non-toxic, pharmaceutically acceptable salts thereof.

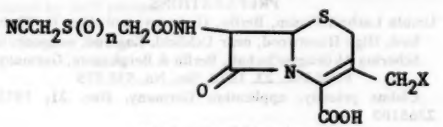
3,957,984

SUBSTITUTED MERCAPTOACETAMIDOCEPHALOSPORINS

Robert M. DeMarinis, King of Prussia, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 389,407, Aug. 17, 1973, Pat. No. 3,883,520. This application Feb. 11, 1975, Ser. No. 548,949
Int. Cl.² A61K *31/54*
U.S. Cl. 424—246 24 Claims

1. A pharmaceutical composition comprising an antibacterially effective amount of a compound of the formula



where

n is 0, 1, or 2;

X is SHet; and

Het is a 5 or 6-membered heterocyclic ring containing carbon and 1–4 atoms selected from the group consisting of N, O, and S, unsubstituted or substituted with one or two substituents selected from the group consisting of alkyl of c_1–C_6, alkoxy of C_1–C_6, allyloxy, oxide, halogen, carboxamido, carboxyl, carbalkoxy of C_1–C_6, mercapto, methylthio, trifluoromethyl, hydroxy, amino, alkylamino and dialkylamino, each undefined alkyl having 1–6 carbon atoms

or a non-toxic pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier therefor.

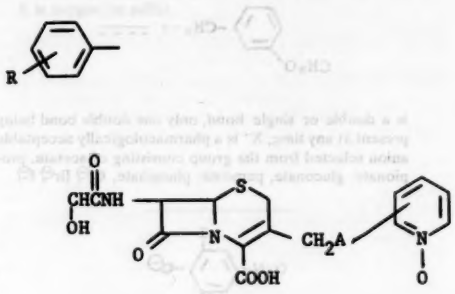
3,957,985

MANDELAMIDOCEPHALOSPORINS WITH IMPROVED PROPERTIES

James S. Frazee, Collingswood, N.J., and Timothy Yu-Wen Jen, Broomall, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 376,653, July 5, 1973, Pat. No. 3,884,914. This application Feb. 25, 1975, Ser. No. 552,908
Int. Cl.² A61K *31/54*
U.S. Cl. 424—246 10 Claims

1. A pharmaceutical composition comprising an antibacterially effective amount of a compound of the formula



where

R is hydrogen, alkyl or alkoxy of C_1–C_4, fluoro, chloro, bromo, hydroxy, amino, nitro, or trifluoromethyl or a non-toxic pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier therefor.

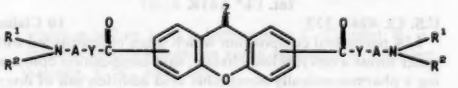
3,957,986

ANTIVIRAL COMPOSITIONS CONTAINING BIS-BASIC ESTERS AND AMIDES OF XANTHENE AND XANTHONE

Albert A. Carr; Robert W. Fleming, and Arthur D. Sill, all of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Division of Ser. No. 162,716, July 14, 1971, Pat. No. 3,859,307. This application July 2, 1973, Ser. No. 375,754
Int. Cl.² A01N *9/00*
U.S. Cl. 424—248 15 Claims

1. A pharmaceutical composition in unit dosage form comprising a significant quantity of a pharmaceutical carrier and from about 2.0 milligrams to 3 grams of a compound of the formula



wherein:

Z is oxygen or H_2; each of R^1 and R^2 is hydrogen, (lower)-alkyl, cycloalkyl of 3 to 6 ring carbon atoms, alkenyl of 3 to 6 carbon atoms having the vinyl unsaturation in other than the 1-position of the alkenyl group, or each set of R^1 and R^2 taken together with the nitrogen atom to which they are attached is pyrrolidion, piperidino, N-(lower)-alkylpiperazino, or morpholino;

each A is alkylene of 2 to about 8 carbon atoms and separates its adjacent Y and amino nitrogen by an alkylene chain of at least 2 carbon atoms; each Y is oxygen, or N-R wherein R is hydrogen or (lower)-or a pharmaceutically acceptablee acid addition salt thereof.

3,957,987

COMPOSITIONS CONTAINING A CARBONAMIDOQUINOXALINE-DI-N-OXIDE AND METHOD OF USING SAME

Florin Seng, Cologne; Kurt Ley, Odenthal-Globusch, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

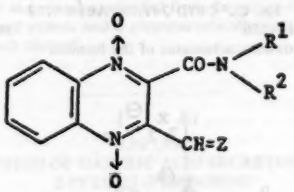
Division of Ser. No. 399,445, Sept. 30, 1973, which is a division of Ser. No. 249,121, May 1, 1972, Pat. No. 3,839,326. This application Sept. 26, 1974, Ser. No. 509,325

Claims priority, application Germany, May 7, 1971, 2122572

Int. Cl.² A61K *31/535*

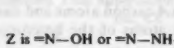
U.S. Cl. 424—248 **83 Claims**

41. A method of promoting growth in animals and of improving feed utilization in animals which comprises administering to said animal a growth promoting amount of a compound of the formula:



wherein

each of R^1 and R^2, independent of the other, is hydrogen, lower alkyl, hydroxy(lower alkyl), (lower alkoxy)lower alkyl, cyclopentyl, cyclohexyl or cycloheptyl, or R^1 and R^2, together with the nitrogen atom to which they are attached, are pyrrolidino, piperidino, hexamethyleneimino, morpholino or thiomorpholino; and



in which Y is an oxygen or sulfur atom and R^3 is lower alkyl, hydroxy(lower alkoxy), lower alkoxy, pyridyl, or $—NR^5R^6$ in which each of R^5 and R^6, independent of the other, is hydrogen, lower alkyl, hydroxy(lower alkyl) or lower alkoxy(lower alkyl), or R^5 and R^6, together with the nitrogen atom to which they are attached, are pyrrolidino, piperidino, hexamethyleneimino, morpholino or thiomorpholino;

in combination with an animal feed or water.

3,957,988

ANTIVIRAL COMPOSITIONS CONTAINING BIS-BASIC KETONES OF THIOXANTHENE

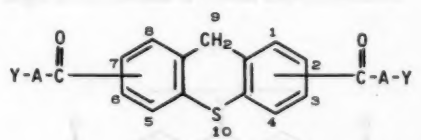
Robert W. Fleming, Ann Arbor, Mich., and Arthur D. Sill, Greenhills, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 137,055, April 23, 1971, Pat. No. 3,856,789. This application Feb. 20, 1973, Ser. No. 334,075

Int. Cl.² A01N *9/00*

U.S. Cl. 424—248 **32 Claims**

1. A pharmaceutical composition for inhibiting viral infections, in unit dosage form, comprising a significant quantity of a pharmaceutically acceptable carrier and from about 0.1 milligram of 3 grams of a compound selected from a base of the formula

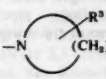


wherein A is a straight or branched alkylene chain having from 1 to about 6 carbon atoms; and each Y is

A. the group

wherein R^1 and R^2 are individually hydrogen, allyl or lower alkyl having from 1 to about 4 carbon atoms; or

B. the group



wherein *n* is a whole integer of 4 or 5, and R^3 is hydrogen or lower alkyl having from 1 to about 4 carbon atoms and can be linked to any one of the carbon atoms of the heterocyclic group; or

C. the group

wherein X is oxygen or NR^4, and R^4 is hydrogen or lower alkyl of from 1 to about 4 carbon atoms;

or a pharmaceutically acceptable acid addition salt thereof.

3,957,989

ANTIVIRAL COMPOSITIONS CONTAINING BIS-BASIC KETONES OF XANTHENE AND XANTHEN-9-ONE

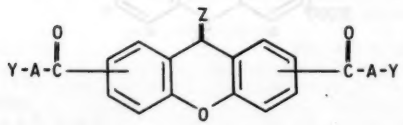
Robert W. Fleming, Ann Arbor, Mich.; Arthur D. Sill, Greenhills, and Francis W. Sweet, Cincinnati, both of Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 97,379, Dec. 11, 1970, Pat. No. 3,859,286. This application Feb. 20, 1973, Ser. No. 333,768

Int. Cl.[2] A01N *9/00*

U.S. Cl. 424—248 **28 Claims**

1. A pharmaceutical compositon for inhibiting viral infections, in unit dosage form, comprising a significant quantity of a pharmaceutically acceptable carrier and from about 0.1 milligram to about 3 grams of a compound selected from a base of the formula



wherein Z is a member selected from the group consisting of oxygen of H_2; each A is a straight or branched alkylene chain of from 1 to about 6 carbon atoms; and each Y is a member selected from the group consisting of

A. the group

wherein R^1 and R^2 are individually selected from the group consisting of hydrogen, lower alkyl having from 1 to about 6 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, alkenyl of from 3 to 6 carbon atoms and having the vinyl unsaturation in other than the 1-position of the alkenyl group; or

B. the group

wherein *n* is a whole integer from 4 to 6, and R^3 is a member selected from the group consisting of hydrogen or lower alkyl of from 1 to about 4 carbon atoms and can be linked to any one of the carbon atoms of the heterocyclic group; or

C. the group

wherein X is a member selected from the group consisting of oxygen or NR^4, and R^4 is hydrogen or lower alkyl of from 1 to about 4 carbon atoms,

or a pharmaceutically acceptable acid addition salt thereof.

3,957,990

OXIME CARBAMATES

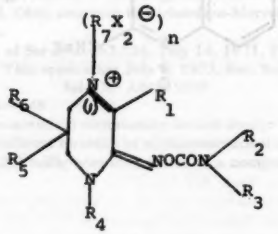
David L. Booth, and Richard M. Rodebaugh, both of Crystal Lake, Ill., assignors to Morton-Norwich Products, Inc., Chicago, Ill.

Filed Mar. 5, 1975, Ser. No. 555,416

Int. Cl.[2] C07D *241/08*; A01N *9/22*

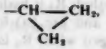
U.S. Cl. 424—250 **106 Claims**

1. Novel oxime-carbamates of the formula



where

R_1 is $-CH_3$, $-CH(CH_3)_2$.

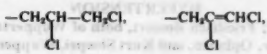


$-C(CH_3)_3$, or $-C_6H_5$;

R_2 is $-H$ or $-CH_3$;

R_3 is $-CH_3$, $-CH_2CH_3$, $-(CH_2)_2CH_3$, $-(CH_2)_3CH_3$, $-CH_2CH_2Cl$ or $-C_6H_5$;

R_4 is $-H$, $-CH_3$, $-CH_2CH_3$, $-(CH_2)_2CH_3$, $-CH(CH_3)_2$, $-(CH_2)_3CH_3$, $-CH_2CH=CH_2$, $-CH_2C\equiv CH$, $-C_6H_5$,



$-CH(OH)CCl_3$, $-CH_2CH_2X_1$, where X_1 is $-Cl$, $-Br$, $-NH_2$, $-OH$, $-OCOCH_3$, $-OCOCH_2Cl$, or $-OCONHCH_3$;

R_5 and R_6 are each $-H$ or $-CH_3$, with the proviso that when R_5 and R_6 are both CH_3 then both CH_3 groups may be on either the same carbon atom or on different carbon atoms;

R_7 is H, $-CH_3$ or $-CH_2C_6H_5$;

X_2 is Cl, $-Br$ or $-I$; and

n is 0 or 1, with the proviso that when n is 1 then N bears a + charge and X_2 bears a − charge.

3,957,991

INHIBITION OF GASTRIC ACID SECRETION WITH SUBSTITUTED PERIMIDINES

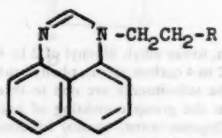
Russell J. Taylor, Jr., Palmyra, N.J., assignor to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Continuation-in-part of Ser. No. 417,668, Nov. 20, 1973, abandoned. This application Dec. 12, 1974, Ser. No. 532,130

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 **4 Claims**

1. A method of inhibiting gastric acid secretion in a gastric hyperacidic subject which comprises internally administering thereto an effective gastric acid secretion inhibiting amount of a member selected from the group consisting of a substituted perimidine of the formula:



wherein R is a member selected from the group consisting of hydroxy and cyano, and a pharmaceutically acceptable acid addition salt thereof.

3,957,992

INHIBITION OF GASTRIC ACID SECRETION WITH 2-PYRIDYL-PERIMIDINE

Russell J. Taylor, Jr., Palmyra, N.J., assignor to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Continuation-in-part of Ser. No. 417,665, Nov. 20, 1973, abandoned. This application Dec. 12, 1974, Ser. No. 531,958

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 **2 Claims**

1. A method of inhibiting gastric acid secretion in a gastric hyperacidic subject which comprises internally administering thereto an effective gastric acid secretion inhibiting amount of a member selected from the group consisting of 2-pyridyl-perimidine and a pharmaceutically acceptable acid addition salt thereof.

3,957,993

INHIBITION OF ULCERS WITH PYRROLYL-SUBSTITUTED PERIMIDINES

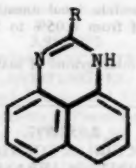
Russell J. Taylor, Jr., Palmyra, N.J., assignor to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Continuation-in-part of Ser. No. 417,669, Nov. 20, 1973, abandoned. This application Dec. 12, 1974, Ser. No. 532,280

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 **2 Claims**

1. The method of aiding the prevention and amelioration of stomach ulcers which comprises orally or parenterally administering to a subject having a stomach ulcer an effective stomach ulcer-inhibiting amount of a member selected from the group consisting of a pyrrolyl-substituted perimidine of the formula:



wherein R is a member selected from the group consisting of pyrrolyl and N-methylpyrrolyl, and a pharmaceutically acceptable acid addition salt thereof.

3,957,994

TOPICAL ANTI-INFLAMMATORY COMPOSITION AND METHOD OF USE

Richard Allen Schroer, Silverado, Calif., assignor to Nelson Research & Development Company, Irvine, Calif.

Filed Dec. 19, 1974, Ser. No. 534,228

Int. Cl.² A61K *31/52*

U.S. Cl. 424—253 **10 Claims**

1. A composition useful in the treatment of inflammation of the skin comprising about 0.1 to about 1 percent by weight of theophylline together with about 5 to about 99.9 percent by weight of 2-pyrrolidone or N-lower alkyl-2-pyrrolidone.

3,957,995

PHARMACEUTICAL COMPOSITION COMPRISING VINCAMINE AND THEOPHYLLINE

Armand Amselem, Toulouse, France, assignor to Parcor, Paris, France

Filed Dec. 23, 1974, Ser. No. 536,942

Claims priority, application France, Dec. 28, 1973, 73.46741

Int. Cl.² A61K *31/475*, *31/515*, *31/52*

U.S. Cl. 424—253 **14 Claims**

1. A pharmaceutical composition comprising 0.005 to 0.50 grams of vincamine and 0.050 to 0.500 grams of theophylline, the weight ratio of vincamine to theophylline being from 0.01 to 0.1:1.

3,957,996

PHARMACEUTICAL LOCAL ANESTHETIC COMPOSITIONS

Herbert J. F. Adams, Westboro, and Bertil H. Takman, Worcester, both of Mass., assignors to Astra Pharmaceutical Products, Inc., Worcester, Mass.

Continuation-in-part of Ser. No. 206,182, Dec. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 109,942, Jan. 26, 1971, abandoned. This application June 12, 1973, Ser. No. 369,147

Int. Cl.[2] A61K *31/52*

U.S. Cl. 424—253 **18 Claims**

1. An injectable local anesthetic composition having long-lasting local anesthetic effect which is a solution consisting essentially of a pharmaceutically acceptable carrier having dissolved therein

a. an aminoacyl anilide local anesthetic compound in a concentration of from 0.05% to 5% by weight of the carrier and

b. from 0.5 to 10 micrograms of saxitoxin per milliliter of the carrier.

3,957,997

ANTICOCCIDIAL COMPLEXES OF 4,4'-DINITROCARBANILIDES

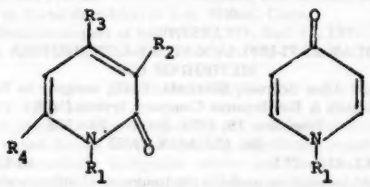
Edward F. Rogers, Middletown; Richard A. Dybas, Edison, and John Hannah, Matawan, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

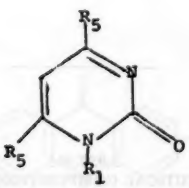
Continuation-in-part of Ser. No. 316,180, Dec. 18, 1970, abandoned. This application Sept. 26, 1974, Ser. No. 509,380

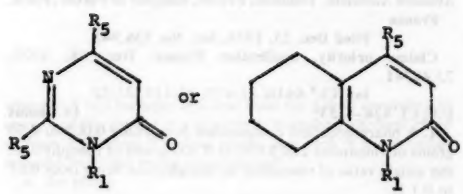
Int. Cl.[2] A61K *31/44, 31/505*

U.S. Cl. 424—263 **7 Claims**

1. A composition for the prevention and cure of coccidiosis which comprises an inert carrier and an effective amount of one or more complexes of 4,4'-dinitrocarbanilide and one of the heterocyclic compounds having the formula:







wherein R_1 is methyl or ethyl; R_2 is hydrogen or lower alkoxy; R_3 and R_4 are the same and are (a) lower alkyl when R_2 is hydrogen and (b) hydrogen when R_2 is lower alkoxy; and R_5 is lower alkyl.

3,957,998

USE OF 2,6-DIAMINO-4-SUBSTITUTED-1,4-DIHYDROPYRIDINE-3,5-DICARBOXYLIC ACID ESTERS FOR EFFECTING CORONARY VESSEL DILATION AND TREATING HYPERTENSION

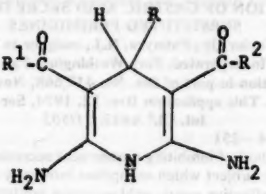
Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 336,483, Feb. 28, 1973, Pat. No. 3,855,231. This application Mar. 27, 1974, Ser. No. 455,258 Claims priority, application Germany, Mar. 6, 1972, 2210687

Int. Cl.[2] A61K *31/455*

U.S. Cl. 424—266 **68 Claims**

1. A pharmaceutical composition useful for effecting coronary vessel dilation and treating hypertension in humans and animals which comprises a coronary vessel dilating amount or an antihypertensive amount of a compound of the formula:



wherein

R is hydrogen; lower alkyl; alkenyl of 2 to 4 carbon atoms; alkynyl of 2 to 4 carbon atoms; phenyl; substituted phenyl in which the substituents are one to three members selected from the group consisting of lower alkyl, lower alkoxy, halogeno, nitro, cyano, trifluoromethyl, azido, carbo(lower alkoxy), lower alkylsulfonyl, lower alkylsulfinyl, lower alkylthio and phenyl; or naphthyl; and each of R^1 and R^2, taken independently of the other, is lower alkoxy, lower alkoxy (lower alkoxy), alkenyloxy of 2 to 4 carbon atoms, alkynyloxy of 2 to 4 carbon atoms, amino, lower alkylamino or di(lower alkyl) amino,

in combination with a pharmaceutically acceptable non-toxic inert diluent or carrier.

32. A method according to claim 23 wherein the compound is 2,6-diamino-4-(2-fluorophenyl)-1,4-dihydropyridine-3,5-dicarboxylic acid diethyl ester.

3,957,999

ANILINOBENZOTHIAZOLES AS ANTIDEPRESSANTS

Christopher James Sharpe, Harrow Weald, England, assignor to The Boots Company, Nottingham, England

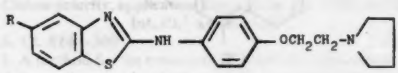
Division of Ser. No. 343,565, March 21, 1973, Pat. No. 3,897,443. This application Sept. 18, 1974, Ser. No. 506,994

Int. Cl.[2] A61K *31/425*

U.S. Cl. 424—270 **13 Claims**

1. A therapeutic composition useful for treating depression which comprises an antidepressant effective amount of a

benzothiazole compound selected from the group consisting of a compound of the formula



and a pharmaceutically acceptable acid addition salt thereof, wherein R is a member selected from the group consisting of hydrogen and methoxy, together with a pharmaceutically acceptable carrier.

3,958,000

FUNGICIDAL 2-ARYLTHIO-, 2-ALKYLTHIO- AND 2-HALOALKYLTHIO-1,2,4-OXADIAZOLIDINE-3,5-DIONES

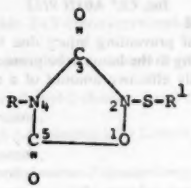
Laroy H. Edwards, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 17, 1975, Ser. No. 541,915

Int. Cl.² C07D *271/06*

U.S. Cl. 424—272 **11 Claims**

1. A compound of the formula



wherein R is alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 8 carbon atoms, phenyl substituted with up to 2 of the same or different substituents selected from fluoro, chloro, bromo or alkyl of 1 to 4 carbon atoms, and R^1 is haloalkyl of 1 to 2 carbon atoms and of 1 to 5 of the same or different halogens selected from fluoro, chloro or bromo.

3,958,001

4-ALKYL-1,2-DIMETHYL-3,5-DIPHENYLPYRAZOLIUM SALTS AND DERIVATIVES THEREOF AS FUNGICIDAL AGENTS

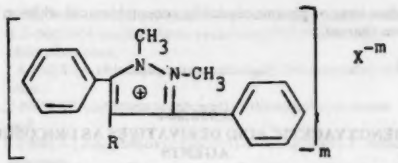
Barrington Cross, Rocky Hill, and Bryant Leonidas Walworth, Pennington, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 2, 1975, Ser. No. 574,067

Int. Cl.² A01N *9/22*; **A61K** *31/415*

U.S. Cl. 424—273 **13 Claims**

1. A method for controlling fungi comprising, contacting said fungi with a fungicidally effective amount of a compound having the formula:



wherein R is a member selected from the group consisting of alkyl C_1-C_3, allyl, propargyl, benzyl and carbethoxymethyl; X represents an anion with a charge of from 1 to 3; and m represents an integer from 1 to 3.

3,958,002

MEDICAMENTS HAVING PSYCHOTROPIC PROPERTIES (ANTITUSSIVES)

Antoine Stenger; Henri Cousse, and Gilbert Mouzin, all of Castres, France, assignors to Pierre Fabre S.A., France

Continuation-in-part of Ser. No. 264,501, June 20, 1972. This application Jan. 6, 1975, Ser. No. 538,754

Int. Cl.² C07D *207/08*

U.S. Cl. 424—274 **9 Claims**

1. 5-Bromo-N-N′-pyrrolidino-alkyl)-orthocresotamide having from 2 to 5 carbon atoms in the alkyl moiety and therapeutically acceptable salts thereof.

3,958,003

ORGANIC COMPOUNDS

Jean-Michel Bastian, Therwil; Klaus Hasspacher, Riehen, and Michael Strasser, Basel, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

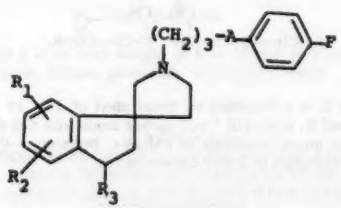
Continuation-in-part of Ser. No. 419,670, Nov. 28, 1973, Pat. No. 3,901,916, which is a continuation-in-part of Ser. No. 282,609, Aug. 21, 1972, abandoned. This application May 2, 1975, Ser. No. 573,850

Claims priority, application Switzerland, Nov. 28, 1972, 17291/72

Int. Cl.² A61K *31/40*

U.S. Cl. 424—274 **29 Claims**

1. A method of treating pain in animals which comprises administering to an animal in need of such treatment an analgesic effective amount of a compound of the formula



wherein

R_1 is hydrogen, alkyl of 1 to 3 carbon atoms, fluorine, chlorine, bromine or methoxy,

R_2 is hydrogen, alkyl of 1 to 3 carbon atoms, chlorine or methoxy, or

R_1 and R_2 are ortho one to another and together form a methylene dioxy group,

R_3 is hydroxy, alkylcarboxy of 2 to 5 carbon atoms or monoalkylcarbamoyloxy of 2 to 5 carbon atoms, and

A is carbonyl, 1,3-dioxolan-2-ylidene or 1,3-dioxan-2-ylidene,

in free base or pharmaceutically acceptable acid addition salt form thereof.

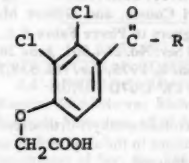
3,958,004

PHENOXYACETIC ACID DERIVATIVES AS URICOSURIC AGENTS

Edward J. Cragoe, Jr., Lansdale, and George M. Fanelli, Jr., Penllyn, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 23, 1974, Ser. No. 463,227
Int. Cl.² A61K *31/38, 31/495, 31/34*
U.S. Cl. 424—275 **4 Claims**

1. Method of maintaining or decreasing uric acid levels in the body which comprises administering to a patient in need thereof a uricosuric effective amount in unit dosage form of a compound of the formula:



I

wherein R is 2-thienyl, 5-methyl-2-thienyl or 2-furyl and the alkali metal salt of a said acid and addition salts of a said acid with a pharmaceutically acceptable base.

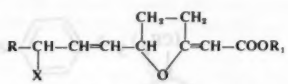
3,958,005

TETRAHYDROFURAN DERIVATIVES

Daniel Hainaut, Villemomble; Jean-Pierre Demoute, Montreuil-sous-Bois, and Pierre Girault, Paris, all of France, assignors to Roussel Uclaf, Paris, France

Filed Feb. 3, 1975, Ser. No. 546,454
Claims priority, application France, Feb. 13, 1974, 74.04817
Int. Cl.² C07D *307/28*
U.S. Cl. 424—285 **11 Claims**

1. A tetrahydrofuran of the formula



wherein R is a branched or linear alkyl of 1 to 10 carbon atoms and R_1 is alkyl of 1 to 5 carbon atoms and X is selected from the group consisting of chlorine, bromine, —OH and alkylcarbonyloxy of 2 to 5 carbon atoms.

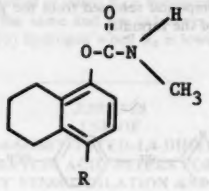
3,958,006

CARBAMATE PESTICIDAL COMPOSITIONS

Linwood K. Payne, Jr., deceased, late of Charleston, W. Va. (by Betty Lou B. P. Payne, executrix), assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 252,329, May 10, 1972, Pat. No. 3,849,478. This application Mar. 6, 1974, Ser. No. 448,699
Int. Cl.² A01N *9/12, 9/20*
U.S. Cl. 424—300 **5 Claims**

1. A pesticidal composition comprising an acceptable carrier and, as an active toxicant an insecticidally effective amount of a compound of the formula:



wherein R is an amino, lower alkyl amino, dilower alkyl amino, formamido, lower acylamido, phenylcarboxamido, lower alkylideneimino, dilower alkylamino, lower alkyleneimino, lower alkylureido, dilower alkylureido, lower phenylalkoxy, lower alkylthio, lower phenylalkylthio, lower alkyl sulfinyl, and lower alkyl sulfonyl.

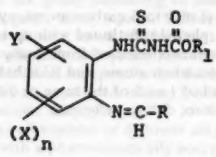
3,958,007

PESTICIDAL ALKYL 4-(0-(SUBSTITUTED METHYLENEAMINE)-PHENYL)-3-THIOALLOPHANATES

Joel Benjamin Wommack, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 865,947, Oct. 13, 1969, Pat. No. 3,836,569. This application May 24, 1974, Ser. No. 473,156
Int. Cl.² A01N *9/12*
U.S. Cl. 424—300 **12 Claims**

1. A method of preventing injury due to mites or fungi comprising applying to the locus to be protected from fungi or mites a pesticidally effective amount of a compound of the formula:



wherein

X is hydrogen, fluorine, chlorine, or bromine;

Y is hydrogen or alkyl of 1 to 4 carbon atoms;

R_1 is alkyl of 1 to 12 carbon atoms;

R is phenyl; or phenyl substituted with halogen, alkyl of 1 to 3 carbon atoms, nitro, hydroxy or methoxy; when Y is alkyl, *n* is 0 and and when Y is hydrogen, *n* is 1, 2 or 3 or the sodium, potassium, lithium, calcium, barium, copper, zinc and manganese salts of these compounds.

3,958,008
ANTHELMINTIC METHODS OF USE

Yoshinobu Hashimoto, Fujisawa; Kinpei Kato, Tokyo, and Nobuo Sato, Chiba, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

Filed Dec. 28, 1970, Ser. No. 102,081
Claims priority, application Japan, Aug. 20, 1970, 45-72377
Int. Cl.[2] A61K *31/27*
U.S. Cl. 424—300 **3 Claims**

1. A method for the treatment of helminth infections in man and domestic animals which comprises administering to man or a domestic animal infected with helminths an anthelmintically effective amount of a benzene derivative selected from the group consisting of:

2-(3-ethoxycarbonyl-2-thioureido)-N,N-dimethylaniline,
2-(3-ethoxycarbonyl-2-thioureido)-N,N-dimethylaniline hydrochloride,
1-(3-ethoxycarbonyl-2-thioureido)2-N,N-dimethyl-aminobenzene oxalate,
1-formamido-2-(3-methoxycarbonyl-2-thioureido)-benzene,
1-acetamido-2-(3-methoxycarbonyl-2-thioureido)-benzene,
1-propionamido-2-(3-ethoxycarbonyl-2-thioureido)-benzene,
1-cyclopropancarbonamido-2-(3-methoxycarbonyl-2-thioureido)-benzene,
1-benzamido-2-(3-ethoxycarbonyl-2-thioureido)-benzene,
1-methoxycarbonamido-2-(3-ethoxycarbonyl-2-thioureido)-benzene,
1-ethoxycarbonamido-2-(3-methoxycarbonyl-2-thioureido)-benzene,
1-(3-n-propylureido)-2-(3-methoxycarbonyl-2-thioureido)-benzene,
1-(3-n-butylureido)-2-(3-methoxycarbonyl-2-thioureido)-benzene,
1-(3-n-butylureido)-2-(3-ethoxycarbonyl-2-thioureido)-benzene,
1-thioformamido-2-(3-ethoxycarbonyl-2-thioureido)-benzene,
1-(2-thiocarbamoyl-aminophenyl)-3-ethoxycarbonylthiourea,
1-(3-ethoxycarbonyl-2-thioureido)-2-(3-methyl-2-thioureido)-benzene,
1-(3-n-propyl-2-thioureido)-2-(3-ethoxycarbonyl-2-thioureido)-benzene,
1-(3-N,N-dimethylamino-2-thiocarbonyl-2-thioureido)-2-(3-methoxycarbonyl-2-thioureido)-benzene,
1-(3-N,N-dimethylaminothiocarbonyl-2-thioureido)-2-(3-ethoxycarbonyl-2-thioureido)-benzene,
1-(3-N,N-dimethylamino-carbonyl-2-thioureido)-2-(3-methoxycarbonyl-2-thioureido)-benzene,
1-benzylidenamino-2-(3-methoxycarbonyl-2-thioureido)-benzene,
1-(4-chlorobenzylidenamino)-2-(3-methoxycarbonyl-2-thioureido)-benzene,
1-(4-methoxybenzylidenamino)-2-(3-methoxycarbonyl-2-thioureido)-benzene,
1-(3-nitrobenzylidenamino-2-(3-ethoxycarbonyl-2-thioureido)-benzene,
1-benzenesulfonicamido-2-(3-methoxycarbonyl-2-thioureido)-benzene,
1-(4-toluenesulfonicamido)-2-(3-ethoxycarbonyl-2-thioureido)-benzene
1(4-chlorobenzenesulfonicamodo)-2-(3-methoxycarbonyl-2-thioureido)-benzene,
1.2-bis(3-benzyloxycarbonyl-2-thioureido)-benzene,
1.2-bis[3-(β-methoxy) ethoxycarbonyl-2-thioureido]benzene,
1.2-bis]3-(β-chloroethoxycarbonyl)-2-thioureido]benzene,
1.2-bis(3-allyloxycarbonyl-2-thioureido)benzene,
1.2-bis[3-(2-propynyloxycarbonyl)-2-thioureido] benzene,
1.2-bis[3-(4-chlorophenoxycarbonyl)-2-thioureido]benzene,
1.2-bis[3-(4-nitrophenoxycarbonyl)-2-thioureido]benzene,
1.2-bis[3-(4-methylphenoxycarbonyl)-2-thioureido]-4-chlorobenzene,
3.4-bis[3-(4-chlorophenoxycarbonyl)-2-thioureido]-toluene,
1.2-bis[3-(2-naphthoxycarbonyl)-2-thioureido]benzene and
1.2-bis[3-(2-naphthoxycarbonyl)-2-thioureido]-4′-nitrobenzene.

3,958,009
AMMONIUM AND POTASSIUM ISOBUTYRATES AS PATHOGEN GROWTH INHIBITORS AND GROWTH STIMULATORS

Paul D. Lepore, Glenelg, and Peter A. Hahn, Ellicott City, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 442,267, Feb. 13, 1974, abandoned, which is a division of Ser. No. 308,030, Nov. 20, 1972, Pat. No. 3,806,600, which is a continuation-in-part of Ser. No. 76,224, Sept. 28, 1970, abandoned, which is a continuation-in-part of Ser. No. 1,311, Jan. 1, 1970, abandoned. This application June 30, 1975, Ser. No. 591,975
Int. Cl.[2] A01K *31/19*
U.S. Cl. 424—317 **9 Claims**

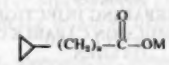
1. The method of inhibiting the growth of animal pathogens in animals, said pathogens being selected from the group consisting of *Candida albicans*, Salmonella species, and *Escherichia coli*, which comprises feeding to the animal in its daily diet 0.25 to 2.0 weight percent of ammonium or potassium isobutyrate based upon the total weight of the animal's daily diet.

3,958,010
MITE CONTROL

William E. Willy, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Mar. 6, 1975, Ser. No. 555,757
Int. Cl.[2] A01N *9/24*
U.S. Cl. 424—318 **5 Claims**

1. A method for controlling spider mites which comprises applying to the eggs of the spider mite, an ovicidally effective amount of a compound of the formula



wherein *n* is an even integer of 6 to 14 and M is hydrogen, ammonium, lithium, potassium, sodium or calcium.

3,958,011
COMPOSITIONS OF TRI-N-PROPYLACETIC ACID AND SALTS THEREOF AND TREATMENT OF NEUROLOGICAL DISORDERS WITH SUCH COMPOSITIONS

Charles Pigerol, St. Ouen, and Pierre Luc Eymard, Fontaine, both of France, assignors to Labaz, Paris, France

Continuation-in-part of Ser. No. 426,730, Dec. 13, 1973. This application Mar. 31, 1975, Ser. No. 563,809
Claims priority, application France, Dec. 11, 1972, 72.43946
Int. Cl.[2] A61K *31/16*
U.S. Cl. 424—320 **6 Claims**

1. A method for treating central neurological disorders due to or accompanied by cerebral ischemia in a host in need of such treatment comprising administering to said host an effective dose of a compound selected from the group comprising tri-n-propylacetic acid and an alkali metal salt thereof.

3,958,012

D 2-(6-SUBSTITUTED-2-NAPHTHYL)-PROPANALS

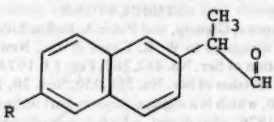
John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif., assignors to Syntex Corporation, Palo Alto, Calif.

Division of Ser. No. 301,595, Oct. 27, 1972, Pat. No. 3,891,712, which is a continuation of Ser. No. 865,216, Oct. 9, 1969, which is a continuation-in-part of Ser. Nos. 741,900, July 21, 1968, Pat. No. 3,626,012, and Ser. No. 814,855, April 9, 1969, Pat. No. 3,663,713. This application Mar. 27, 1975, Ser. No. 562,714

Int. Cl.[2] A61K *31/11*

U.S. Cl. 424—333 9 Claims

1. A pharmaceutical composition for use in treatment of inflammation, pain and fever in mammals which comprises an amount therapeutically effective to treat inflammation, pain, or pyrexia of a compound represented by the formula:



where R is methyl, ethyl, isopropyl, cyclopropyl, trifluoromethyl, vinyl, ethynyl, fluoro, chloro, methoxy, methoxymethyloxy, difluoromethoxy, methylthio, methoxymethylthio or difluoromethylthio, in combination with a non-toxic, pharmaceutically acceptable excipient.

3,958,013

HALOGENATED CYCLOBUTYL ETHER ANESTHETICS

Vincent I. DiBiasio, Billerica; Charles W. Simons, Bedford, and Gerald J. O'Neill, Arlington, all of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Jan. 10, 1975, Ser. No. 540,075

Int. Cl.[2] A61K *31/075*

U.S. Cl. 424—339 4 Claims

1. The process of inducing anesthesia in a mammal, which comprises administering by inhalation to said mammal an effective quantity for inducing anesthesia of a 2-methoxycyclobutyl ether selected from the group consisting of: 1-chloro-2-methyoxy-1,2,3,3,4,4-hexafluorocyclobutane, 1-chloro-2-methoxy-1,4,4-trifluorocyclobutane and 1-bromo-2-methoxy-1,2,3,3,4,4-hexaflurocyclobutane.

3,958,014

PROCESS FOR PREPARING INJECTION-PURPOSE FLUOROCARBON EMULSION CAPABLE OF CARRYING OXYGEN

Ryozo Watanabe, Takatsuki; Tadakazu Suyama, Hirakata; Kazumasa Yokoyama, Suita, and Yohei Odaka, Kyoto, all of Japan, assignors to The Green Cross Corporation, Osaka and Tanabe Seiyaku Co., Ltd., both of, Japan

Continuation-in-part of Ser. No. 177,434, Sept. 2, 1971, abandoned. This application Mar. 20, 1973, Ser. No. 343,148

Claims priority, application Japan, Sept. 5, 1970, 78023/70 Japan, July 29, 1971, 57003/73

Int. Cl.[2] A61K *45/00*

U.S. Cl. 424—366 3 Claims

1. A process for preparing an injectable emulsion of fluorocarbon particles adapted to carry oxygen in an aqueous vehicle, said process comprising

a. emulsifying an aqueous physiologically acceptable electrolyte solution containing from about 10 up to at most about 30 W/V %, based on the emulsion, of a fluorocarbon selected from the group consisting of perfluorodecalin, perfluoromethyldecalin and their mixture and from about 3 W/V % to about 5 W/V %, based on the emulsion, of yolk lecithin, and continuing the emulsification until said fluorocarbon particles are dispersed in the aqueous phase and distributed in a particle range size of from about 0.05 to about 1.0 microns by injecting the emulsion with a Manton-Gaulin type injection emulsifier under a pressure of 140 kg/cm^2 at the first stage, under a pressure of 500 kg/cm^2 at the second and third stages, under a pressure of 560 kg/cm^2 at the fourth stage and under a pressure of 140 kg/cm^2 at the fifth stage at 50° C or less;

b. continuously centrifuging the aqueous emulsion of step (a) with a De Laval type centrifuge at a flow rate of 30 l/hour while setting the mortar and the rotor at 1500 rpm. and 9000 rpm, respectively, or with a Saval type centrifuge at a flow rate of 6 l hour, while setting the centrifuge at 100 × g, thereby reducing the particle size of said fluorocarbon particles into particles of the order of about 0.05 to about 0.25 microns and

c. subjecting the aqueous emulsion of step (b) to sterilization at 110° to 120° C for 15 minutes while rotating said emulsion at 15 rpm, thereby preventing substantial agglomeration of said fluorocarbon particles in said emulsion while sterilizing said emulsion.

3,958,015

PURIFIED PLANT PROTEIN CONCENTRATE

Max M. Gay, 24, rue de Bruxelles a 67/, Strasbourg (Bas-Rhin), France

Continuation-in-part of Ser. No. 315,229, Dec. 14, 1972, abandoned. This application June 20, 1975, Ser. No. 588,720

Claims priority, application France, Dec. 14, 1971, 71.46033

Int. Cl.[2] A23J *1/12, 1/14, 3/00;* A23K *1/14*

U.S. Cl. 426—18 10 Claims

1. A process for treating plant material containing both proteins and carbohydrates to obtain a food product intended for humans or animals and which has a higher protein content and a lower carbohydrate content than the starting plant material, which comprises the steps of macerating a liquid aqueous suspension of sub-divided plant material with enzymes acting preferentially on the carbohydrates of the said plant material for a time sufficient to modify the carbohydrates contained therein, in such a manner that these modified carbohydrates are able to be metabolized by alimentary yeasts, and then further macerating said suspension with such yeasts (fam. Saccharomycetaceae) which metabolize said modified carbohydrates for a sufficient time to metabolize the same, the products of said metabolism enriching the protein content of the plant material.

3,958,016

METHOD OF HYDROPROCESSING WHEAT

Edward Louis Galle, St. Paul; Joseph Francis Kolosky, and Joseph Leo Mayou, both of Minneapolis, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Feb. 26, 1975, Ser. No. 553,379

Int. Cl.[2] A23L *1/00*

U.S. Cl. 426—61 20 Claims

1. In a process of hydroprocessing wheat to obtain a wheat product free from husk, said process being of the type wherein wheat is immersed in an aqueous medium and ground or macerated so as to substantially completely disrupt the normal cellular structure of and disperse the endosperm, and wherein the component fractions are subsequently separated from said ground or macerated wheat, throughout said process substantially all of the starch granules being maintained in an intact, ungelatinized form and substantially all of the gluten protein being maintained in a dispersible form and essentially undenatured with respect to doughing function, the improvement which comprises the step of:

inoculating said aqueous medium with a nonpathogenic organism which is not deleterious to said wheat product or said process and which will grow under the conditions of said process, the organic density of said nonpathogenic organism being sufficient to seed the hydroprocessing system with said nonpathogenic organism and create conditions nonconducive to the growth of pathogenic

organisms, thereby reducing the potential for growth of said pathogenic organisms in said system.

3,958,017

BEVERAGE CONTAINING STABILIZED VITAMIN C AND IRON AND METHOD OF MAKING SAME

Lewis D. Morse, Princeton, and Paul A. Hammes, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 391,111, Aug. 27, 1973, abandoned, which is a continuation-in-part of Ser. No. 154,596, June 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 72,855, Sept. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 50,911, June 29, 1970, abandoned, which is a continuation-in-part of Ser. No. 858,892, Sept. 17, 1969, abandoned. This application Nov. 15, 1974, Ser. No. 524,299

Int. Cl.[2] A23L *1/30*

U.S. Cl. 426—72 15 Claims

1. A beverage containing Vitamin C in the amount of 0.025 to 1.2 mg./ml. and 0.0007 to 0.07 mg./ml. of metabolically available iron measured as Fe based on a single strength drink and having added to said beverage cysteine amounting to 0.2 to 2.3% by weight of the Vitamin C.

9. The method of stabilizing the Vitamin C content of a beverage containing Vitamin C in the amount of 0.025 to 1.2 mg./ml. based on a single strength drink which comprises adding to said beverage from 0.2 to 2.3% of cysteine by weight of the Vitamin C.

3,958,018

PROCESS FOR MANUFACTURING CONFECTIONS

Eugenia Tay, New York, N.Y., assignor to Magic Chocolate, Inc., Danbury, Conn.

Filed Dec. 9, 1974, Ser. No. 530,863

Int. Cl.[2] A23G *3/00*

U.S. Cl. 426—103 6 Claims

1. A continuous process for manufacturing confections comprising:

a. distributing a first hardenable liquid confectionary material onto a surface in an openwork pattern having a plurality of interstices;

b. hardening said first liquid confectionary material, at least partially, in said openwork pattern;

c. distributing a second hardenable, liquid confectionary material over the hardened distributed first material, while the distributed first material is supported on a surface, so as to coat the distributed first material;

d. removing the distributed second material from at least some of the interstices defined by the distributed first material so as to reopen, at least partially, said at least some of the interstices, while maintaining a coating of the second material on the distributed first material; and

e. allowing the distributed first and second materials to harden.

3,958,019

COLOR TREATMENT FOR SOYBEAN FOOD PRODUCTS

Kunito Sato, Chicago, and Alfred F. Miller, Jr., Woodridge, both of Ill., assignors to Armour and Company, Phoenix, Ariz.

Filed July 29, 1974, Ser. No. 492,619

Int. Cl.[2] A23L *1/275*

U.S. Cl. 426—250 21 Claims

6. An uncooked soybean food material containing betanin in an amount of from 0.0001 to 0.05% by weight and canthaxanthin in an amount of from 0.00001 to 0.02% by weight, said percentages being based on the amount by weight of said colorants with respect to the dry weight of said material.

11. A process for treating a soybean protein material to improve its color comprising mixing with and absorbing into said material an amount of an aqueous mixture containing betanin in an amount of from 0.0001 to 0.05% and canthaxanthin in an amount of from 0.00001 to 0.02%, said percentages being based on the amount by weight of said colorants with respect to the dry weight of said soybean protein material.

3,958,020

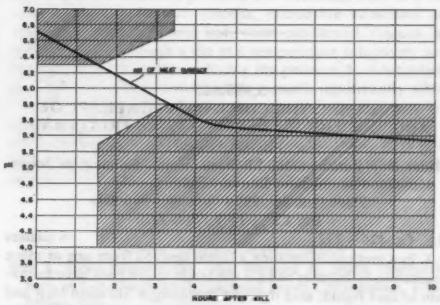
BACTERICIDAL WASH FOR MEAT

Egbert deVries, Kettering, Ohio, assignor to Quad Corporation, Highland Park, Ill.

Filed Jan. 16, 1975, Ser. No. 541,526

Int. Cl.[2] A23B *4/12*

U.S. Cl. 426—265 18 Claims



1. The method of preserving the meat of a slaughtered animal selected from the group consisting of beef, sheep, goats, swine, game animals, and fowl from bacterial decomposition and discoloration and from salmonella infestation which comprises subjecting the exposed surfaces of said meat to washing with an aqueous hypochlorous acid solution corresponding to an available chlorine content from about 50 to about 200 parts per million of said solution being at a pH related to the elapsed time of said wash after the slaughter of said animal within the range of the lower shaded area in the FIGURE for elapsed times of one and two thirds hour up to ten hours and within the range of 4.0 to 5.8 for elapsed times in excess of 10 hours.

3,958,021

COATING FRUIT PIECES WITH LIQUID SHORTENING TO STABILIZE AGAINST DEGRADATION AND DISCOLORATION

Milton L. Cook, Algonquin, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Continuation-in-part of Ser. No. 465,108, April 29, 1974, abandoned. This application Feb. 18, 1975, Ser. No. 550,780

Int. Cl.[2] A23B *7/16*

U.S. Cl. 426—268 6 Claims

1. A process for producing a stable fruit piece, said process comprising:

a. preparing a liquid shortening by heating shortening to a temperature above the melting point thereof to liquefy the shortening, the shortening having a melting point of from about 125°F. to 135°F.;

b. heating fruit pieces to a temperature which is above the temperature of the melting point of the shortening, which is below the degrading point of the fruit pieces, and which prevents congealing of said shortening on contact of the shortening with the fruit pieces;

c. admixing the fruit pieces and shortening while tumbling the fruit pieces until the shortening completely coats the food product particles and comprises 4% to 10% by weight of the fruit pieces;

d. adding a flavoring agent to the coated fruit pieces, and

e. cooling the coated fruit pieces.

3,958,022

PROCESS FOR TREATING SEAFOOD

Andre Danesh, 188 Mason Terrace, Brookline, Mass. 02146

Continuation-in-part of Ser. No. 184,283, Sept. 27, 1971, abandoned. This application Feb. 27, 1974, Ser. No. 446,221

Int. Cl.[2] A22C *25/00*

U.S. Cl. 426—271 8 Claims

1. A process for treating seafood to remove heavy metal ions therefrom, said process comprising washing said seafood with a complexing agent for heavy metal ions and heat treating said seafood at a temperature of at least 212°F and a pressure of at least 1.5 atmospheres for a time sufficient to volatilize and remove said heavy metal ions from said seafood.

3,958,023

INCREASING THE CHILL HAZE STABILITY OF AQUEOUS LIQUIDS DERIVED FROM FRUITS AND VEGETABLES

Elbert Roy Butterworth, Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Oct. 16, 1974, Ser. No. 515,286

Int. Cl.[2] C12H *1/04, 1/10*

U.S. Cl. 426—271 6 Claims

1. In a method of treating a liquid derived from one or more vegetables or fruits to reduce the tendency of chill haze formation in said liquid, said method including a filtration step and the addition of one or more chill haze control agents, the improvement comprising including in a precoat or after precoat layer in the filter media used in said filtration step at least one chill haze control agent, and adding at least one chill haze control agent as body feed to said liquid prior to said filtration step, said chill haze control agents being selected from the group comprising hectorite, acid activated bentonite, acid treated acid activated bentonite, polyvinyl pyrrolidone, polyvinyl polypyrrolidone, natural magnesium silicates, synthetic metal silicates, and acid treated synthetic magnesium silicates containing less than 14 wt. percent MgO.

3,958,024

PROCESS FOR THE PRODUCTION OF A CHOCOLATE SWEET CONTAINING AN INNER SUGAR CRUST

Maria Franca Fissolo, Via Malines 25, Savigliano (Cuneo), Italy

Filed June 20, 1973, Ser. No. 371,795

Claims priority, application Switzerland, June 22, 1972, 9407/72

Int. Cl.[2] A23G *3/00*

U.S. Cl. 426—282 7 Claims

3. A process for the production of a chocolate having a liquid filling comprising:

a. making in a mold a shell of the chocolate having a wall thickness of at least 1.5 mm. and also having portions defining a filling opening,

b. making a hot aqueous filling solution which is unsaturated with sugar but contains a quantity of sugar such as to afford a saturation point at least as high as 30°C,

c. cooling the shell while still in the mold and also the mold itself to no higher than 0°C,

d. introducing into the shell by way of said filling opening while the shell and the mold are no higher than at 0°C a quantity of the solution while the latter is still unsaturated, said quantity having at most twice the weight of the shell, and

e. sealing said filling opening with chocolate,

whereby a crust of sugar subsequently forms in the shell separating the solution from the chocolate.

3,958,025

ABSCISIC ACID TABLETS AND PROCESS

Virginia W-C Livingston, 8492 Prestwick Drive, La Jolla, Calif. 92037

Continuation-in-part of Ser. No. 295,720, Oct. 6, 1972, which is a continuation-in-part of Ser. No. 82,806, Oct. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 831,982, June 10, 1969, Pat. No. 3,768,249, which is a continuation-in-part of Ser. No. 490,629, Sept. 27, 1965. This application July 5, 1974, Ser. No. 485,846

Int. Cl.[2] A61K *31/19*

U.S. Cl. 424—317 14 Claims

1. The method of treating a vitamin deficiency of abscisic acid in man, animal or the avian species, which comprises administering to said man, animal or avian species a composition comprising abscisic acid and a pharmaceutical carrier or food supplement or feed additive, said abscisic acid being administered to said man, animal or avian species in an amount from 10 mcg. to about 20 mg. per kg. of body weight per day.

3,958,026

DISINFECTION AND STERILISATION OF MUSSELS, CRUSTACEA AND FISH

Luigi Leone, Valencia, Spain, and Fulvio Casagrande, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sept. 11, 1974, Ser. No. 505,107

Claims priority, application Switzerland, Sept. 14, 1973, 13271/73

Int. Cl.[2] A23B *4/02*

U.S. Cl. 426—332 10 Claims

1. A method for disinfecting and sterilizing living mussels, Crustacea and fish which comprises contacting said living creatures, in an aqueous medium, with a disinfecting and sterilizing amount of a complex of iodine, polyvinylpyrrolidone and an iodide ion-releasing compound.

3,958,027

EXTRACTION

David George Alexander, Kirkella; Allen Forster, and David William Farmery, both of Hull, all of England, assignors to Simon-Rosedowns Limited, England

Filed June 14, 1974, Ser. No. 479,493

Int. Cl.[2] C12C *11/24*

U.S. Cl. 426—417 3 Claims

1. A method of extracting oil from a fine yeast powder comprising cells containing said oil, said method comprising the steps of forming pellets of the yeast powder, flaking the pellets in a manner which mechanically ruptures said cells, and subjecting the flakes to a solvent extraction process by percolating a solvent for the contained oil through the flakes.

3,958,028

LOW TEMPERATURE HYPOBARIC STORAGE OF METABOLICALLY ACTIVE MATTER

Stanley P. Burg, Miami, Fla., assignor to Grumman Allied Industries, Inc., Garden City, N.Y.

Continuation-in-part of Ser. No. 245,886, April 20, 1972, abandoned. This application Aug. 26, 1974, Ser. No. 500,449

Int. Cl.[2] A23L *3/36;* A23B *4/06, 7/04;* A01N *3/02*

U.S. Cl. 426—418 32 Claims

1. The method of preserving metabolically active matter comprising placing said matter in air in an enclosed space, maintaining the relative humidity of said air between about 80 and 100%, adding fresh air to and moving humid air from said space, controlling the temperature of said matter, maintaining the pressure of said air between about 4 mm. Hg. and 100 mm Hg. absolute, and correlating pressure, temperature, air movement and relative humidity in said space with respect to the nature of the particular matter being preserved.

3,958,029

NOVEL FLAVORING COMPOSITIONS AND PRODUCTS COMPRISING 2,5-DIMETHYL-3-THIOISOVALERYL FURAN

William J. Evers, Red Bank; Howard H. Heinsohn, Jr., Hazlet; Bernard J. Mayers, Cliffwood Beach, and Elizabeth A. Karoll, Old Bridge, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 478,369, June 11, 1974, Pat. No. 3,917,869, which is a continuation-in-part of Ser. No. 386,451, Aug. 7, 1973, Pat. No. 3,873,731. This application Aug. 12, 1975, Ser. No. 603,990

Int. Cl.² A23L *1/226*

U.S. Cl. 426—535 6 Claims

1. A process for preparing a food composition which comprises adding to a food a small but effective amount of 2,5-dimethyl-3-thioisovaleryl furan to impart a creamy, cocoa-like flavor to the composition.

3,958,030

FLAVORING COMPOSITIONS AND PROCESSES UTILIZING SIX MEMBERED HETERO-CYCLIC-POLY-S-COMPOUNDS

Richard Arnold Wilson, Westfield; Ira Katz, West Long Branch; Manfred H. Vock, Locust, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 560,717, March 21, 1975, which is a division of Ser. No. 166,683, July 28, 1971, abandoned. This application Oct. 23, 1975, Ser. No. 625,199

Int. Cl.² A23L *1/235*

U.S. Cl. 426—535 3 Claims

1. A process of altering, modifying or enhancing the fruit flavor or aroma of a foodstuff having a gooseberry, black currant, grape or raspberry taste which comprises adding thereto from about 0.02 up to 100 part per million by weight of a substantially pure form of 2,2,4,4,6,6-hexamethyl-S-trithiane.

3,958,031

PROCESS FOR THE PRODUCTION OF FAT CONTAINING FOOD

Charles Jacques Fleck; Jurg Max De Pizzol, both of Thayngen, Switzerland, and Peter Tolar, Wels, Austria, assignors to CPC International Inc.

Filed Feb. 5, 1975, Ser. No. 547,324

Claims priority, application Switzerland, Feb. 5, 1974, 1559/74

Int. Cl.² F25D *25/00;* A23L *3/36*

U.S. Cl. 426—579 4 Claims

1. In the process of preparing a dry, substantially powdery, edible, fat-containing product by mixing together fat plus the other ingredients of said product to form a mixture thereof and subsequently recovering the finished product, the improvement comprising adding, during the mixing of the ingredients and the fat, solid particles of dry ice of geometrically uniform shape and size, and particles having a diameter of about 2 mm.–15 mm. and a length of about 10 mm.–40 mm. said particles being added in an amount such as to lower the temperature of the mixture without freezing said mixture during mixing to such an extent as to render the entire mixture free-flowing and homogeneous.

3,958,032

METHOD OF PUFFING MOIST FOOD PRODUCTS USING BOTH INERT NON-CONDENSIBLE GAS AND VAPORIZED MOISTURE

Charles J. Merriam, Chicago, Ill., assignor to The Griffith Laboratories, Inc., Chicago, Ill.

Filed Feb. 3, 1975, Ser. No. 546,428

Int. Cl.² A23J *3/00*

U.S. Cl. 426—580 22 Claims

1. The method of puffing hot, water-moistened, viscous, extrudable food materials comprising: working a mass of water-moistened food material having at least about 5% by volume of air, as measured at atmospheric pressure, under high super-atmospheric pressure and sufficient heat to a hot, mixed, water-moistened, viscous, extrudable condition; advancing a column of said hot, water-moistened, viscous, extrudable mass through a die at a temperature selectively near but below 212°F., while reducing the pressure to substantially atmospheric so that contained air expands significantly within the mass and contained water vaporizes within the mass to a significant but controlled extent to add its vapor pressure to the partial pressure of air within the die-confined, advancing mass; and, extruding the mass from the die at substantially atmospheric pressure to provide a puffed food product.

3,958,033

SHELF STABLE EMULSIONS

Rex J. Sims, Pleasantville, and Howard D. Stahl, Hartsdale, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 434,531, Jan. 18, 1974, abandoned. This application Sept. 9, 1974, Ser. No. 504,213

Int. Cl.² A23D *5/00*

U.S. Cl. 426—602 11 Claims

1. As a food product, a shelf-stable, protein-free emulsion having a pH within the range of from about 6 to about 8, and consisting of in combination, on a weight basis:

a. from about 0.1 part to 1 part of neutral type fat, substantially free of both fatty and of mineral acidity;

b. about 1 part water;

c. about 2 parts sugar; and

d. from about 0.25% to about 7% by weight of the total emulsion of an emulsifier selected from the group consisting of sodium stearyl fumarate and sodium succinoylated monoglycerides.

10. As a food product a shelf-stable, protein-free emulsion having a pH within the range of from about 6 to about 8, and consisting of in combination, on a weight basis:

a. from about 0.1 part to 1 part of neutral type fat, substantially free of both fatty and mineral acidity;

b. about 1 part water;

c. about 2 parts sugar;

d. from about 0.25% to about 7% by weight of the total emulsion of an emulsifier selected from the group consisting of sodium stearyl fumarate and sodium succinoylated monoglycerides;

e. 0.75% to 5%, by weight of the total emulsion, of an adjunct emulsifier; and

f. food additives selected from the group consisting of flavoring, coloring and combinations of these.

3,958,034

FRACTIONATED EGG YOLK PRODUCT

Kaser Rajinder Nath, Ithaca, N.Y., and Mark William Newbold, West Chester, Pa., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Feb. 6, 1975, Ser. No. 547,626

Int. Cl.² A23L *1/32*

U.S. Cl. 426—614 4 Claims

1. An egg yolk having been separated into three fractions, the first fraction (F_1) comprising about 47% of the volume of the total egg yolk, the second fraction (F_2) comprising about 42% of the volume of the total egg yolk, and the third fraction

(F_3) comprising about 11% of the volume of the total egg yolk, wherein the distribution of fat, protein, and cholesterol in the fractions is about:

Fraction	% of Total Fat (weight)	% Total Protein (weight)	% of Total Cholesterol (weight)
F_1	50.7	33.8	44.0
F_2	43.9	53.4	33.0
F_3	5.3	12.6	23.0.

3,958,035

METHOD OF MANUFACTURING OMELET TYPE EGG PRODUCT

Charles K. Stearns, Prospect Heights, and Andrew D. Singleton, Northfield, both of Ill., assignors to Kraftco Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 286,899, Sept. 7, 1972, abandoned. This application Mar. 11, 1974, Ser. No. 450,204

Int. Cl.² A23C *3/00*

U.S. Cl. 426—614 **7 Claims**

1. A method for making an omelet type egg product comprising providing egg white and egg yolk in substantially the proportions of whole egg, agitating said egg white and egg yolk sufficiently to break the yolk and provide an egg mix consisting essentially of egg yolk solids, egg white solids and water, adjusting the moisture of said egg mix to a level of from about 78 percent to about 85 percent by weight, preheating said egg mix by steam injection to a temperature in the range of from about 160°F to about 170°F, introducing a predetermined amount of said preheated egg mix into a pan, said pan having a temperature of less than about 200°F at the time of introducing said egg mix into said pan, heating said egg mix in said pan while said egg mix is quiescent until said egg mix is set so as to provide a substantially cooked egg product in the shape of said pan, terminating heating of said egg product, removing said egg product from said pan, folding said removed egg product to provide an omelet type egg product within about 2 minutes from the time heating of the egg product is terminated, said folding being effected in a manner so as to decrease the exterior radius of curvature at the point of folding, said folding of said egg product being effected by supporting a center portion of said egg product and moving opposing edges of said egg product vertically upward so as to cause opposing surfaces adjacent said center portion to pivot upwardly from said center portion and move into substantial alignment in face to face relationship, and restraining said folded egg product in said folded position for at least about 10 seconds.

3,958,036

STABLE AVOCADO BASE PREPARATION

Floyd E. Latimer, Inglewood, Calif., assignor to Cav-Pro, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 59,760, July 30, 1970, abandoned. This application Feb. 25, 1972, Ser. No. 229,579

Int. Cl.² A23L *1/00*

U.S. Cl. 426—628 **11 Claims**

1. A process of preparing a stable avocado admixture comprising:

adding avocado flesh, water, and vegetable gums together to produce an admixture; and

homogenizing said admixture until a fine dispersion is produced in which at least about 90 percent of the fat globules have diameters of less than about 10 microns, at least about 80 percent of the fat globules do not differ in diameter from one another by more than about 10 microns, the viscosity of said fine dispersion being at least about 5,500 centipoises, and said fine dispersion being stable for a period of at least about one month.

3,958,037

SOLIDIFIED PRODUCT FROM SORGHUM

Elmer F. Glabe, Chicago; Perry W. Anderson, Niles, and Stergios Laftsidis, Chicago, all of Ill., assignors to Food Technology, Inc., Chicago, Ill.

Division of Ser. No. 348,134, April 5, 1973, Pat. No. 3,843,821. This application July 1, 1974, Ser. No. 484,431

The portion of the term of this patent subsequent to Sept. 3, 1991, has been disclaimed.

Int. Cl.² C13F *3/00*

U.S. Cl. 426—654 **8 Claims**

1. A dehydrated composition consisting essentially of the following ingredients:

Ingredients	Parts by Weight
Sorghum syrup solids	40–70
Partially gelatinized starch of a type having a gelatinization temperature of at least 150°F.	60–0
Honey solids	0–60
High fructose corn syrup	0–60
Soy protein having a protein content of at least 45% by weight, a water soluble protein content at least 20% by weight of the total protein content and a weight ratio of water soluble protein to fat content of at least 1.5:1	0.25–40
Water	0.5–4.0
Emulsifier	0–1
Antihumectant	0–1

with the further proviso that the product contains at least 0.25 part of said soy protein when it also contains added starch, and at least 30 parts of said soy protein when it contains no added starch.

3,958,038

RECOVERY OF CELLULAR PROTEIN PRODUCTS FROM MICROBIOLOGICAL SYNTHESIS MASSES

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 26, 1973, Ser. No. 418,915

Int. Cl.² A23J *1/18*

U.S. Cl. 426—656 **9 Claims**

1. In the process of recovering microbiologically produced cellular protein products useful as animal food from the medium in which they were produced by adjusting the pH to a level which will permit flocculation, adding a sufficient amount of a flocculating agent to cause flocculation, followed by physical separation, the improvement comprising utilizing as the flocculating agent a proteinaceous material capable of flocculating the cellular protein products.

3,958,039

METHOD FOR COATING LEAD-ATTACHED ELECTRONIC DEVICE

Toshihiro Yabuki; Nobuyuki Yamane; Takumi Tanigawa, all of Kameyama; Shigenori Nakagawa, Suzuka, and Toshimasa Tanichi, Kameyama, all of Japan, assignors to Nitto Denki Kigyo Kabushiki Kaisha (Nitto Electric Industrial Co., Ltd.), Ibaraki, Japan

Filed July 16, 1974, Ser. No. 489,049

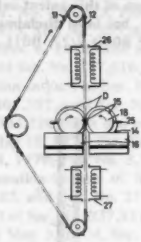
Claims priority, application Japan, Mar. 8, 1974, 49-28326

Int. Cl.² B05D *5/12, 3/02*

U.S. Cl. 427—58 **4 Claims**

1. A method of coating only an element of an electronic device to which leads are attached with a powder coating of a material which is meltable and curable, comprising the steps of placing the electronic device on a conveyor and holding it on the conveyor by means of the leads, passing the electronic device on the conveyor through a furnace means for preliminarily heating the element to a temperature which will partially melt the coating material upon contact, then passing the electronic device on the conveyor between spaced opposed

rotatable porous coating members having grooves in their peripheries substantially the same width as the length of the element, rotating said coating members to pass the peripheries through bodies of powder coating material while applying a vacuum to the coating members for picking up on the peripheries of the coating members a mass of powder coating material which fills the grooves and projects beyond the peripheries of the coating members a distance such that when the coating members rotate past the point at which they are opposed, the



powder coating material on one coating member contacts the powder coating material on the other coating member and when an element of an electronic device is between the coating members, the powder coating material is applied thereto from opposite sides thereof under pressing contact, and is partially melted, and then passing the electronic device on the conveyor through a further furnace means for further heating the element for completing the melting and curing of the powder coating material.

3,958,040

SEMICONDUCTOR DEVICE MANUFACTURE

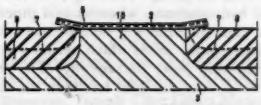
Peter William Dellar Webb, Chandlers Ford, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 30, 1974, Ser. No. 502,147

Claims priority, application United Kingdom, Sept. 7, 1973, 42131/73

Int. Cl.² H01L *21/02*

U.S. Cl. 427—94 **9 Claims**



1. A method of producing a semiconductor device comprising a silicon body in which there is located an oxide layer that is sunk locally from a surface of said body and that extends over at least part of the thickness of said body, comprising the steps of:

a. providing said silicon body;

b. locally providing on said silicon body surface a first masking layer capable of masking the underlying silicon against oxidation;

c. forming a recess in a part of said silicon body at the area at which said sunken oxide layer is to be provided, said recess extending under a part of said first masking layer;

d. covering the side walls portions of said recess, which side walls portions are disposed under said first masking layer part, with a second masking layer to protect against oxidation the silicon underlying said second masking layer part; and

e. oxidizing said silicon at the unmasked area at the bottom of said recess to form said sunken oxide layer.

3,958,041

ROAD MARKING MATERIAL

Reinhard Wagner, Mainz; Hinrich Hinrichs, Mainz-Gonsenheim, and Paul Oberressl, Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Nov. 19, 1973, Ser. No. 416,814

Claims priority, application Germany, Nov. 23, 1972, 2257431

Int. Cl.² C08K *3/00, 3/34*

U.S. Cl. 427—137 **23 Claims**

1. In a resinous road-marking composition consisting essentially of pigment, filler and binder, the improvement wherein the binder comprises hydrocarbon resin which:

a. has an average molecular weight of up to 10,000,

b. is based on at least one olefinically-unsaturated monomer having a boiling point within the range from 130° to 200°C, and

c. contains from 4 to 50 percent by weight of chemically built-in phenolic components, and the weight ratio of binder to the total of filler and pigment is within the range of from 1:3 to 1:10.

23. A method of applying a marking to a surface destined to bear vehicular traffic which comprises applying to said surface a composition as claimed in claim **1** as a hot melt.

3,958,042

METHOD FOR MANUFACTURE OF REFLECTION-PROOF FILM

Shizuko Katsube, and Yoshiyuki Katsube, both of Ikeda, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 236,983, March 22, 1972, abandoned. This application Mar. 14, 1974, Ser. No. 451,084

Claims priority, application Japan, Apr. 5, 1971, 46-21160

Int. Cl.² G02B *1/10;* **C03C** *17/22*

U.S. Cl. 427—162 **1 Claim**

1. A method for vacuum depositing a homogeneously composed optical film onto the surface of a substrate which method consists essentially of:

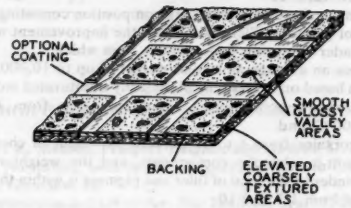
1. mixing one component having low refractive index, the low refractive index component having a vaporization temperature of from 1000°C to 1400°C, and selected from the group consisting of $ThOF_2$, ThF_4, MgF_2, Na_3AlF_6, Al_2O_3 and CeF_3 with one component of high refractive index, the high refractive index component having a vaporization temperature of from 1900°C to 2500°C, and selected from the group consisting of ZnS, TiO, TiO_2, ThO_2 ZrO_2 and CeO_2 in proportion such that the resultant mixture has a required refractive index;
2. dividing the said mixture into fractions each of an amount to give a vacuum deposited film of a thickness falling within a range of from $1/20\lambda$ to $1/80\lambda$, wherein λ is the medium wavelength in the zone of wavelengths of the light whose reflection is to be prevented;
3. heating one of the divided fractions under reduced pressure and controlled temperatures such that the compound of low refractive index is first vaporized out of that fraction and allowed to form a film substantially of the compound of low boiling point on the surface of a substrate;
4. thereafter heating and vaporizing the compound of high refractive index and depositing a film substantially of the compound of high refractive index onto the film previously formed substantially of the compound of low refractive index until the entirety of said fraction is vacuum deposited on said substrate; and
5. causing remaining fractions to be vacuum deposited one on top of another by repeating the procedure of Steps (3) -(4) under reduced pressure and controlled temperature until the overall thickness of the vacuum deposited optical film having a required refractive index and a thickness of $n.1/4\lambda$, wherein n is an integer.

3,958,043

METHOD OF MAKING CHEMICALLY EMBOSSED SURFACE COVERINGS

Allan W. McKee, Jr., Millersville, and Jack H. Witman, Lancaster, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Nov. 19, 1974, Ser. No. 525,168
Int. Cl.[2] B05D 3/04, 3/10; B32B 3/00
U.S. Cl. 427—195 16 Claims



1. The process of forming a textured, embossed decorative surface covering which comprises preparing a dryblend containing

a. a vinyl resin,

b. a plasticizer for said vinyl resin, and

c. a polymerizable monomer, compatible with the plasticized vinyl resin, said monomer containing at least two olefinically usaturated sites, and capable of addition polymerization at a temperature in the range of from about 300°–400°F in the presence of an addition polymerization catalyst,

depositing a layer of the dryblend on a backing,

heating to form an unfused porous cohesive layer from said dryblend, applying to said porous layer in a predetermined pattern a first printing composition containing a polymerization inhibitor that will prevent polymerization of said monomer in said temperature range,

applying over the entire surface of the printed porous layer a second printing composition containing a catalyst that will cause polymerization of said monomer in said temperature range, and heating the resulting layer to said temperature range to fuse the resinous dryblend, and polymerize and cross-link said monomer in those portions of said dryblend not printed with said first printing composition.

3,958,044

METHOD FOR COATING INORGANIC COMPOUNDS IN POWDERED FORM

Tadashi Yamaguchi; Takayuki Ono; Hirobumi Tanaka, all of Sendai; Hiroshi Hoshi, Narashino; Michio Hirakawa, and Isao Watanabe, both of Ichikawa, all of Japan, assignors to Lion Yushi Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1974, Ser. No. 438,533
Claims priority, application Japan, Feb. 3, 1973, 48-13919; Feb. 3, 1973, 48-13921
Int. Cl.[2] B05D 7/00
U.S. Cl. 427—221 7 Claims

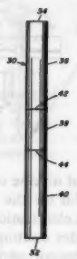
1. A method of producing vinyl-polymer coated inorganic material which comprises contacting a powdery inorganic material consisting essentially of at least about 0.5% by weight of a transition metal compound and the balance of an inert inorganic material, the weight of said transition metal compound being calculated as a metal based on the inert inorganic material, with a coating material which comprises at least about 0.1 part by weight per 100 parts of weight of said transition metal compound of a vinyl monomer in an aqueous polymerization medium containing a polymerization initiator consisting essentially of hydrogen sulfite ions of the formula HSO_3^- in the amount, calculated as sulfur dioxide, of about 0.01-100 parts by weight per 100 parts by weight of said monomer, whereby said monomer polymerizes in said medium as a coating on said powdery material, and recovering the coated powdery material.

3,958,045

METHOD OF MAKING AN AUTOMATIC VOLUME CONTROL PIPET

Charles M. Coleman, 958 Washington Road, Pittsburgh, Pa. 15228

Division of Ser. No. 206,442, Dec. 9, 1971, Pat. No. 3,783,696.
This application Aug. 8, 1973, Ser. No. 386,823
The portion of the term of this patent subsequent to Jan. 8, 1991, has been disclaimed.
Int. Cl.[2] B05D 7/22; B01L 3/02
U.S. Cl. 427—230 3 Claims



1. A method of manufacturing a pipet comprising

providing an elongated tubular pipet body composed of a hydrophilic glass material and defining a continuous interior passageway having a fluid entry end and a venting end,

subsequently establishing a hydrophobic first zone within said tubular pipet body by coating said passageway with a layer of hydrophobic material selected from the group consisting of silicones, fluorocarbons and hydrocarbons,

an uncoated portion of said tubular pipet providing a hydrophilic second zone within said passageway between said first zone and said fluid entry end, and

establishing a hydrophobic third zone between said fluid entry end and said hydrophilic second zone by coating said third zone with a layer of hydrophobic material selected from the group consisting of silicones, fluorocarbons and hydrocarbons, whereby said pipet body of hydrophilic glass material will be provided with hydrophobic and hydrophilic zones which permit automatic retention within said pipet passageway of a predetermined volume of an aqueous fluid less than the full volume of said pipet passageway.

3,958,046

COATING FOR CORROSION RESISTANCE

Alfonso L. Baldi, Drexel Hill, Pa., assignor to Alloy Surfaces Co., Inc., Wilmington, Del.

Continuation-in-part of Ser. Nos. 219,514, Jan. 20, 1972, Pat. No. 3,801,357, Ser. No. 304,220, Nov. 6, 1972, Ser. No. 357,616, May 7, 1973, Ser. No. 404,665, Oct. 9, 1973, said Ser. No. 219,514, is a continuation-in-part of Ser. No. 837,811, June 30, 1969, abandoned, and Ser. No. 90,682, Nov. 18, 1970, Pat. No. 3,764,371, said Ser. No. 90,682, is a continuation-in-part of Ser. No. 837,811, , said Ser. No. 304,220, Ser. No. 357,616, and Ser. No. 404,665, each is a continuation-in-part of Ser. No. 254,403, May 18, 1972, Pat. No. 3,785,854, and Ser. No. 90,682,. This application Feb. 27, 1974, Ser. No. 446,473
Int. Cl.[2] C23C 11/02
U.S. Cl. 427—252 6 Claims

1. In the pack diffusion coating of aluminum on ferrous substrates at temperatures below 1000°F with an aluminum

halide energizer, the improvement according to which the energizer is supplied only as an upper layer over the diffusion coating pack, and the pack is held in a retort cup not over 15 inches deep.

3,958,047

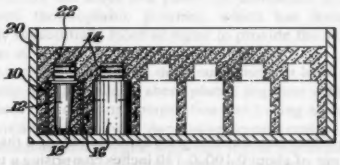
DIFFUSION TREATMENT OF METAL

Alfonso L. Baldi, Drexel Hill, Pa., assignor to Alloy Surfaces Co., Inc., Wilmington, Del.

Continuation-in-part of Ser. Nos. 328,378, Jan. 31, 1973, Pat. No. 3,867,184, Ser. No. 446,473, Feb. 27, 1974, Ser. No. 404,665, Oct. 9, 1973, Ser. No. 357,616, May 3, 1973, and Ser. No. 304,220, Nov. 6, 1972, said Ser. No. 446,473, said Ser. No. 404,665, said Ser. No. 357,616, said Ser. No. 304,220, each is a continuation-in-part of Ser. No. 219,514, Jan. 20, 1972, Pat. No. 3,801,357, said Ser. No. 404,665, Ser. No. 357,616, Ser. No. 304,220, each is a continuation-in-part of Ser. No. 254,403, May 18, 1972, Pat. No. 3,785,854, and Ser. No. 90,682, Nov. 18, 1970, Pat. No. 3,764,371, said Ser. No. 254,403, is a continuation-in-part of Ser. No. 219,514, said Ser. No. 90,682, and Ser. No. 219,514, each is a continuation-in-part of Ser. No. 837,811, June 30, 1969. This application May 3, 1974, Ser. No. 466,908

Int. Cl.² C23C 9/02

U.S. Cl. 427—252 **5 Claims**



1. In the pack diffusion coating of a small portion of the surface of a protectively cased superalloy while the balance of the surface is packed against an essentially inert pack and the case contains added diffusible metal from the class consisting of aluminum, chromium, nickel, cobalt and mixtures thereof, the improvement according to which the essentially inert pack contains depletion-inhibiting amounts of said added diffusible metals.

3,958,048

AQUEOUS SUSPENSIONS FOR SURFACE ACTIVATION OF NONCONDUCTORS FOR ELECTROLESS PLATING

Lawrence P. Donovan, Temple City; Eileen Maguire, and Leon A. Kadison, both of Pasadena, all of Calif., assignors to Crown City Plating Company, El Monte, Calif.

Filed Apr. 22, 1974, Ser. No. 462,947

Int. Cl.² B05D 3/10; C23C 3/02

U.S. Cl. 427—304 **29 Claims**

1. An activator suspension for the one stage surface activation of a nonconductive surface for electroless plating which comprises an aqueous suspension of water insoluble particles catalytically active for the reduction and deposition of metal ions contained in an electroless plating solution and formed by an aqueous phase reaction of at least one ionic non-noble metal with a water soluble co-reactant which is a hydride capable of forming the catalytically active water insoluble particles upon reaction with said basic non-noble metals in the presence of at least one water soluble organic suspending agent for said water insoluble particles, the water insoluble particles in said suspension being of a particle size sufficiently small to be absorbable onto the surface of a nonconductive substrate to activate the surface for electroless plating when said suspension is at a pH below about 5.0 and between about 7.7 and about 9.5.

3,958,049

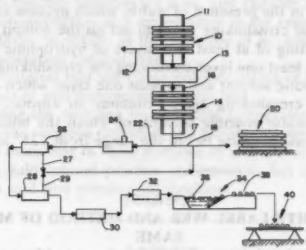
METHOD OF INSPECTING AND TREATING SUCKER ROD

Bobby L. Payne, Midland, Tex., assignor to Rodco, Inc., Odessa, Tex.

Continuation-in-part of Ser. No. 195,658, Nov. 4, 1971. This application July 19, 1974, Ser. No. 490,210

Int. Cl.² B05D 1/18, 3/12

U.S. Cl. 427—327 **16 Claims**



1. A continuous process for improving ferrous metal sucker rods wherein the rods are protected against corrosion and hydrogen ion embrittlement comprising the steps of:

1. using the metal sucker rods downhole in a borehole;
2. removing the metal sucker rods of step (1) from the borehole;
3. cleaning the surface of the rods of step (2). to remove debris and scale therefrom;
4. mechanically cold working and further cleaning the exterior surface of the cleaned rods of step (3) by shot peening the surface thereof;
5. carrying out (4) by moving the rod longitudinally while rotating the rod about its longitudinal central axis at a rate which exposes the entire outer surface area of the rod to the action of the shot peening of step (4);
6. electronically inspecting the rods by the eddycurrent inspection method to determine the symmetry of composition;
7. electronically inspecting the rods by the flux leakage method to determine the presence of flaws therein;
8. carrying out steps (6) and (7) by moving the rod longitudinally at 30 feet per minute while rotating the rod about its longitudinal central axis at a rate of 53 revolutions per minute which exposes the entire outer surface area of the rod for inspection;
9. inspecting the pin ends of the rod to determine the presence of flaws therein;
10. discarding those rods of steps (69 and (7) and (9) whose structural integrity is deficient for carrying its designed load;
11. demagnetizing the remaining rods of step (10) to reduce the magnetic attractive properties thereof;
12. coating the exterior surface of the rods of step (11) with an organic inhibiting agent;
13. carrying out the coating step immediately following the inspection and demagnetizing steps; and, carrying out the inspection steps immediately following the mechanical cold working step so as to avoid subsequent oxidation and contamination of the cleaned rod surface.

3,958,050

PROCESS FOR CROSSLINKING HYDROPHILIC COLLOIDS

Thomas Stauner, Marly; Rainer Kitzing, Villars S. Glane; Remon Hagen, Marly, and Carlo Boragine, Fribourg, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Apr. 10, 1974, Ser. No. 459,519
Claims priority, application Switzerland, Apr. 12, 1973, 5224/73
Int. Cl.² B05D 3/10
U.S. Cl. 427—333 12 Claims

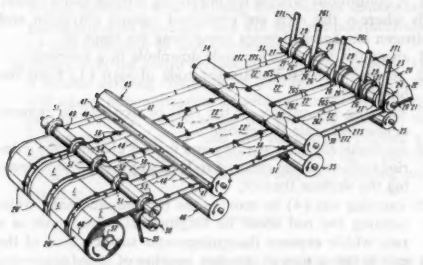
1. Process for crosslinking hydrophilic colloids present on a layer carrier which colloids contain amino, imino and/or hydroxyl groups, by means of water-soluble organic crosslinking agents in the presence of water, which process comprises allowing the crosslinking agent to act on the colloid in a system consisting of at least two layers of hydrophilic colloids, wherein at least one layer containing the crosslinking agent is free of aprotic solvent and at least one layer which does not contain a crosslinking agent, contains an aprotic, organic, nonbasic, water-miscible solvent, of which the boiling point under normal pressure lies in the range from 125° to 300°C.

3,958,051

COMPOSITE LABEL WEB AND METHOD OF MAKING SAME

Thomas M. Smith, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 278,409, Aug. 7, 1972, Pat. No. 3,892,901.
This application Jan. 17, 1975, Ser. No. 541,960
Int. Cl.² B32B 3/16, 7/06
U.S. Cl. 428—42 3 Claims



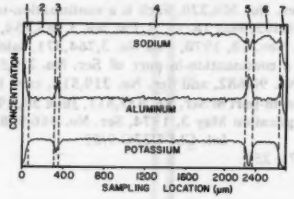
1. A composite web of pressure-sensitive labels, comprising: a longitudinally extending composite web including a web of supporting material and pressure-sensitive label material having a continuous uniform coating of pressure-sensitive adhesive and being releasably adhered to the supporting material, the supporting material extending beyond the label material along a marginal side edge of the composite web to provide an exposed strip portion of supporting material, longitudinally spaced-apart open-sided notches in the marginal side edge through the label material and the underlying supporting material and the adjacent strip portion, each notch being formed in part by a longitudinal cut which constitutes the inner portion of the notch and formed in part by additional cuts extending from a respective end of the longitudinal cut and the side edge of the composite web, and transversely extending lines of at least partial severing in the label material at longitudinally spaced-aparts intervals, each transverse line of at least partial severing in the label material extending across the label material web generally perpendicularly to the longitudinal direction and intersecting the respective longitudinal cut at a location spaced from the ends of the respective longitudinal cut.

3,958,052

SUBSURFACE-FORTIFIED GLASS LAMINATES

Richard E. Galusha; William T. Kane, both of Big Flats; John E. Megles, Jr., Corning, and Joseph M. Williams, Horseheads, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed June 12, 1974, Ser. No. 478,584
Int. Cl.² B32B 7/02; C03C 17/02
U.S. Cl. 428—68 1 Claim



1. In a subsurface-fortified glass laminate having a thickness in the range of about 0.100–0.150 inches comprising a tensilely-stressed central core portion, a pair of compressively-stressed subsurface fortifying layers fused to and substantially enveloping said central core portion, a pair of tensilely-stressed outer core layers fused to and substantially enveloping said subsurface fortifying layers and central core portion, and a pair of compressively-stressed surface layers fused to and substantially enveloping said outer core layers, subsurface fortifying layers, and central core portion, wherein

a. the tensilely-stressed central core portion and outer core layers are composed of a glass having a composition consisting essentially, in weight percent on the oxide basis as calculated from the batch, of about 50–75% SiO_2, 3–20% Al_2O_3, 3–8% F, and 3–20% total of alkali metal oxides selected from the group consisting of Na_2O, K_2O and Li_2O, said Na_2O comprising at least about one third of said total of alkali metal oxides and said K_2O not exceeding about 8% of said composition;

b. the compressively-stressed subsurface fortifying layers and surface layers are composed of a glass having a coefficient of thermal expansion at least about 15×10^{-7}/°C. less than that of the selected core glass and a composition consisting essentially, in weight percent on the oxide basis as calculated from the batch, of about 50–65% SiO_2, 10–20% Al_2O_3, 5–25% CaO, 0–12% MgO, 0–10% B_2O_3, and 0–12% total of oxides selected from the group consisting of Li_2O, Na_2O, K_2O, TiO_2 and ZrO_2; and wherein

c. the tensilely-stressed central core portion and outer core layers have a sodium oxide content equal to or exceeding on a weight percent basis the sodium oxide content of the subsurface fortifying layers;

the improvements which comprise:

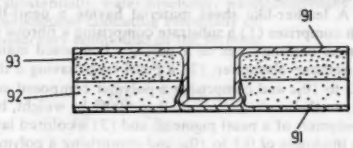
i. maintaining the compressively-stressed subsurface fortifying layers at a thickness in the range of about 0.0015–0.0025 inches; and

ii. spacing the compressively-stressed subsurface fortifying layers a distance of at least about 0.017 inches from the outer surfaces of the glass laminate.

3,958,053
ARTICLES HAVING INTEGRAL TRANSPARENT OR TRANSLUCENT PANELS

James Ernest Ryan, Knebworth, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 260,728, June 8, 1972, Pat. No. 3,832,428. This application June 3, 1974, Ser. No. 475,960
Int. Cl.[2] B32B 3/30
U.S. Cl. 428—159 10 Claims



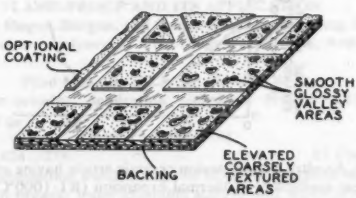
1. A building element comprising at least one substantially opaque cellular sheet and at least one substantially non-cellular transparent or translucent panel in and integral with said sheet and in which the panel is an area which has been rendered non-cellular to provide its transparency or translucency, and wherein the sheet and panel are composed of a water-extended thermoplastic polymer, which has been subsequently substantially freed of water to provide the cells of the cellular structure.

4. An office or domestic door comprising at least one substantially opaque cellular sheet placed together with at least one sheet of a differing composition and having a plurality of substantially non-cellular decorative transparent or translucent panels in and integral with said sheets which allow light to pass through the door, said panels being areas which have been rendered non-cellular to provide the transparency or translucency and form a laminate of the two sheets of differing composition, and wherein the sheet and panel are composed of a water-extended thermoplastic homopolymer of methyl methacrylate or copolymer of methyl methacrylate which has been subsequently substantially freed of water to provide the cells of the cellular structure.

3,958,054
CHEMICAL EMBOSSING OF DECORATIVE SURFACE COVERINGS

Allan W. McKee, Jr., Millersville, and Jack H. Witman, Lancaster, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Nov. 19, 1974, Ser. No. 525,169
Int. Cl.[2] B05D 3/04, 3/10; B32B 3/00
U.S. Cl. 428—172 16 Claims



1. The process of forming a textured, embossed decorative surface covering which comprises

a. preparing a dryblend containing a vinyl resin, and a plasticizer therefor;

b. depositing a layer of the dryblend on a backing;

c. heating to form an unfused porous cohesive layer from said dryblend;

d. applying to said porous layer in a predetermined pattern a first printing composition containing a polymerization inhibitor that will prevent polymerization of a polymerizable monomer which may be subsequently applied to said printed porous layer;

e. applying to said printed porous layer a second printing composition overlapping those areas of the porous layer containing the first printing composition, said second printing composition containing

1. a polymerizable monomer, compatible with the plasticized vinyl resin, said monomer containing at least two olefinically unsaturated sites, and capable of addition polymerization at a temperature in the range of about 300°F. to 400°F. in the presence of an addition polymerization catalyst, and

2. a catalyst that will cause polymerization of said monomer in said temperature range; and

f. heating the resulting layer to said temperature range to fuse the resinous dryblend, and polymerize and cross-link said monomer in those portions of said dryblend printed with said second printing composition, but not printed with said first printing composition.

3,958,055
ADHESIVE BONDING OF ISOTROPIC FIBER WEBS TO FORM PATTERN BONDED COMPOSITES

Thomas A. Hadley, Hendersonville, N.C.; Edward H. Grupe; Jack L. Bergsbaken, both of Appleton, and David P. Hultman, Neenah, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 14, 1974, Ser. No. 497,474
Int. Cl.[2] B32B 5/26, 5/28, 7/14, 31/12
U.S. Cl. 428—198 8 Claims

1. A tissue fiber laminate comprising outer plies of cellulosic tissue with the machine direction of said tissue plies the same, an intermittent substantially isotropic web of randomly oriented fibers, and lines of adhesive in a pattern between said outer plies of tissue attaching the tissue plies to each other with the fibers of the fiber web bonded in the adhesive lines,

said outer tissue plies each having a finished basis weight between about 7 and about 30 g/yd.[2],

said adhesive pattern comprising spaced lines extending transverse to the machine direction of said tissue plies, with the line width being more than about 0.010 inch and less than the spacing between lines, the spacing between lines being not greater than about 0.060 inch, and covering between about 25 and about 50 percent of the total area of the pattern, and the weight of the adhesive in the laminate being in the range of about 3 to about 20 g/yd.[2],

said substantially isotropic web comprising textile fibers in the range of about ⅛ inch to about 3 inches in length, and of ½ to 5 denier, and said web having a weight between about 4 and about 20 g/yd.[2], the fibers being curled and crooked in the web as formed and having a degree of random orientation in the web such that the number of fibers having any given angle of orientation as measured by a tangent to segments on a statistical sample number of fibers is within plus or minus 50% of the average,

and the fibers of said web being free of attachment to each other and to the tissue plies except where attached by the adhesive in the pattern to provide a bonded fiber matrix wherein the B/A factor for said adhesive pattern and said web is less than about 1.5, where A equals the straight line distance between bond points, and B equals the distance between bond points along the path of the crooked fiber segment.

8. A method for the manufacture of tissue fiber laminates comprising

introducing a substantially isotropic web of randomly distributed and well separated textile fibers of a length in the range between about ⅛ inch and about 3 inches, and of

½ to 5 denier between outer plies of cellulosic tissue wherein the machine direction of said tissue plies is the same, and

attaching said tissue plies to each other while reinforcing said laminate to enhance the stretch to break and tensile strength in both the machine and cross directions of the laminate by bonding said isotropic web into a fiber matrix with a clearly defined pattern of essentially continuous spaced adhesive lines extending transverse to the machine direction of said tissue plies, with line width being more than about 0.010 inch and less than the spacing between lines, the spacing between lines being not greater than about 0.060 inch, and covering between about 25 and about 50 percent of the total area of pattern, and the weight of adhesive being in the range of about 3 to about 20 g/yd.^{2}, wherein the B/A factor for said adhesive pattern and said web is less than about 1.5, where A equals the straight line distance between bond points, and B equals the distance between bond points along the path of the crooked fiber segment, and such that the fiber segments contribute to the strength of the fiber matrix and provide a laminate having a grab tensile strength (average of machine and cross direction of above about 6 lbs./in.

3,958,056

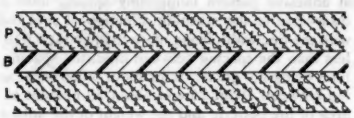
FIBERBOARD CARTON PRODUCT

Latane D. Brugh, Jr., and John W. Smith, Jr., both of Covington, Va., assignors to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 398,215, Sept. 17, 1973, abandoned, which is a division of Ser. No. 207,376, Dec. 13, 1971, Pat. No. 3,802,984. This application July 25, 1975, Ser. No. 599,156

Int. Cl.^{2} B32B *27/10, 29/00*

U.S. Cl. 428—215 **10 Claims**



1. A vapor permeable resistant carton construction material having high adhesive bonding strength and resistance to score cracking comprising first and second laminae of cellulosic fiber sheets separated by a lamina of thermoplastic polymer material bonded to oppositely facing surface planes of said first and second fiber sheets;

said first fiber sheet comprising a substantially 10 to 16 caliper thickness of substantially 10.0 to 11.6 lbs./ream/-caliper density sheet, surface coated with a mixture of clay and a polyvinyl acetate resin binder wherein said binder comprises substantially 20 to 35 percent of said clay weight;

said second fiber sheet comprising a substantially 8 to 27 caliper thickness of substantially 8.5 to 9.0 lbs./ream/-caliper density sheet formed from substantially 40 to 60 percent virgin hardwood unbleached sulphate pulp furnish.

3,958,057

LEATHER-LIKE SHEET MATERIAL HAVING EXCELLENT PEARL-LIKE TINT AND PROCESS FOR PREPARATION THEREOF

Takeo Nishimura, and Kazundo Akamata, both of Okayama, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed June 24, 1975, Ser. No. 589,806

Claims priority, application Japan, June 28, 1974, 49-74173; June 28, 1974, 49-74174; June 29, 1974, 49-74628; Oct. 8, 1974, 49-115893

Int. Cl.^{2} B32B *19/02, 27/40*

U.S. Cl. 428—216 **12 Claims**

1. A leather-like sheet material having a pearl-like tint, which comprises (1) a substrate comprising a fibrous mat and a porous coating layer of a polymer composed mainly of a polyurethane elastomer, (2) a pearl layer having a thickness of 0.2 to 10μ and comprising a polymer composed mainly of a polyurethane elastomer and 3 to 500% by weight, based on the polymer, of a pearl pigment, and (3) a colored layer having a thickness of 0.1 to 10μ and comprising a polymer composed mainly of a polyurethane elastomer and 1 to 300% by weight, based on the polymer, of a dyestuff and/or 1 to 600% by weight, based on the polymer, of a pigment.

2. A leather-like sheet material as set forth in claim 1 wherein the pearl layer is overlayed by the colored layer on the substrate and the colored layer has a thickness of 0.1 to 10μ and comprises a polymer composed mainly of a polyurethane elastomer and 1 to 300% by weight, based on the polymer, of a dyestuff.

3. A leather-like sheet material as set forth in claim 2 wherein a clear layer is further overlayer upon the colored layer, said clear layer having a thickness of 0.1 to 100μ and comprising a polymer composed mainly of a transparent polyurethane elastomer.

4. A leather-like sheet material as set forth in claim 2 wherein a hiding layer is disposed between the substrate and said pearl layer, said hiding layer having a thickness of 0.1 to 10μ and comprising a polymer composed mainly of a polyurethane electromer and 1 to 600% by weight, based on the polymer, of a pigment.

8. A leather-like sheet material as set forth in claim 1 wherein the pearl pigment in the pearl layer is a pigment having a particle size of 1 to 70μ formed by coating mica with titanium oxide.

3,958,058

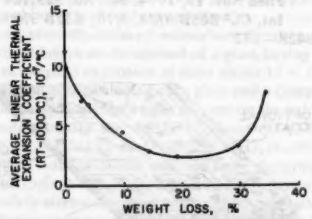
ULTRA-LOW EXPANSION CERAMIC ARTICLES

Thomas H. Elmer, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed July 29, 1974, Ser. No. 492,603

Int. Cl.^{2} C03C *3/22;* **B32B** *5/00*

U.S. Cl. 428—220 **4 Claims**



1. An ultra-low expansion ceramic article having an average linear coefficient of thermal expansion (RT-1000°C.) of less than about 5.4×10^{-7}/°C. and an oxide composition, in weight percent, of about 55–75% SiO_2, 8–32% Al_2O_3, and 7–13% MgO, said article being produced by:

a. selecting a highly crystalline ceramic article having ceramic walls not exceeding about 0.050 inches in thickness, said article containing at least about 95% by weight of crystalline cordierite and being substantially free of glassy phases, and

b. contacting said highly crystalline ceramic article with a strong mineral acid to selectively remove Al_2O_3 and MgO therefrom for a time sufficient to produce a weight loss of about 7–32% in the highly crystalline ceramic article.

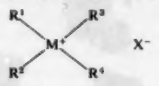
3,958,059
FABRIC TREATMENT COMPOSITION

Francis L. Diehl, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 1, 1973, Ser. No. 402,505
Int. Cl.² D06M *13/52, 13/46*
U.S. Cl. 428—260 **18 Claims**

1. A substantially water-insoluble, water-dispersible antistatic composition, consisting essentially of:

i. a quaternary compound of the formula



wherein M is nitrogen or phosphorus, X is any anion, R^1 is a hydrocarbyl moiety, R^2 is hydrogen or a hydrocarbyl moiety, the total carbon content of $R^1 + R^2$ being at least 22 carbon atoms, and R^3 and R^4 are each hydrogen or hydrocarbyl moieties; and

ii. an electrically conductive salt selected from the group consisting of aluminum salts and non-fluosilicate lithium salts dispersed in said quaternary compound,

at a weight ratio of quaternary compound: salt in the range of 1000:1 to 1:2.

3,958,060
GLASS FIBERS COATED WITH COMPOSITION ADHESIVE TO RUBBER

Gerard E. van Gils, Tallmadge, and Edward F. Kalafus, Akron, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 380,939, July 19, 1973, Pat. No. 3,930,095. This application Sept. 29, 1975, Ser. No. 617,460
Int. Cl.² B29H *9/02;* B32B *17/04, 25/02;* C03C *25/02*
U.S. Cl. 428—261 **10 Claims**

1. A glass fiber reinforcing element containing from about 10 to 40% by weight (dry) based on the weight of said element of a heat cured adhesive composition useful for adhering said element to a rubber compound and comprising essentially 100 parts by weight of a rubbery vinyl pyridine copolymer, from about 2 to 28 parts by weight of trimethylol phenol and from about 1.25 to 24 parts by weight of at least one water soluble, thermoplastic and non heat hardenable resorcinol compound selected from the group consisting of resorcinol and a resorcinol-formaldehyde novolak, said composition coating and at least substantially totally impregnating said element.

3,958,061
COMPOSITION FOR MAKING TEXTILES FLAME-PROOF AND ITS APPLICATION

Heinrich Singer, Horgau, and Sandor Csajági, Augsburg, both of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 16, 1973, Ser. No. 360,872
Claims priority, application Germany, May 27, 1972, 2225934
Int. Cl.² C09K *3/28*
U.S. Cl. 428—276 **17 Claims**

1. A composition which is capable of forming a stable emulsion in an organic water-insoluble solvent and which is suitable for flame-proofing textiles, which composition in aqueous solution has a pH-value greater than 3.6, and wherein the composition comprises a salt of (a) guanidine or its salts with weak acids, dicyandiamide, cyanamide, a condensate of guanidine and formaldehyde, a condensate of dicyandiamide and formaldehyde, or a condensate of cyanamide and formaldehyde, (b) a phosphoric acid mono- or di-ester of an alcohol of 1 to 4 carbon atoms, and (c) 3 to 15% by weight, based on the solid content of the composition, of a phosphoric acid mono- or di-ester of an alcohol of the formula $R^1(—O—C_2H_3R^2)_xOH$, wherein x is 2 to 14, R^1 is a saturated alkyl group of 4 to 18 carbon atoms, and R^2 is hydrogen or methyl, or an alkali metal, ammonium or amine salt thereof.

11. A process for flame-proofing textile materials, which comprises treating said materials with an emulsion in an organic water-insoluble solvent of the composition defined in claim 1.

17. Textile materials finished in accordance to claim 11.

3,958,062
SOLAR ENERGY REFLECTING FILM STRUCTURE AND PROCESS OF MANUFACTURE THEREFOR

Robert Edward Moynihan, Lowell, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 235,401, March 16, 1972, Pat. No. 3,876,552. This application Dec. 3, 1974, Ser. No. 529,078
Int. Cl.² B32B *5/16, 15/20, 17/06;* G02B *5/26*
U.S. Cl. 428—328 **16 Claims**

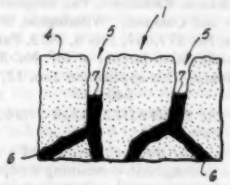
1. A laminate structure comprising at least one layer of a light transmitting material having firmly adhered to at least one surface thereof an optically transparent and solar energy reflecting film structure of polyvinyl acetal having dispersed therein opaque metal platelets of a particle size between about 5 microns and about 43 microns and a visible light transmission of at least about 8 percent wherein said opaque metal platelets are present said film structure in an amount between 0.005 and about 2% by weight, based upon the total weight of said film structure.

6. A laminate structure comprising two layers of a light transmitting material and an intermediate layer firmly adhered therebetween of an optically transparent and solar energy reflecting film structure of polyvinyl acetal having dispersed therein opaque metal platelets of a particle size between about 5 microns and about 43 microns and a visible light transmission of at least about 8 percent wherein said opaque metal platelets are present in said film structure in an amount between 0.005 and about 2% by weight, based upon the total weight of said film structure.

3,958,063
COMPOSITE PARTICLE HAVING SURFACE RECESSING OR INDENTATION

Bruce H. Robson, Cilandak Garden Estates, Jalan Taman D-2, Cilandak, Kebayoran Baru, Jakarta Selantan, Indonesia

Filed Jan. 16, 1974, Ser. No. 433,664
Int. Cl.² B32B *19/04, 17/00, 7/14*
U.S. Cl. 428—329 **2 Claims**



1. A composite particle-elastomeric material comprising a plurality of composite particles mixed with an elastomeric material, the composite particles comprising abrasive subparticles connected by a bonding material and having numerous surface capillaries formed by subjecting the composite particles to capillarization treatment, said capillarization treatment comprising the step of subjecting the particles, prior to mixing with the elastomeric material, to a process whereby capillaries

are formed in the surface of the particles by the selective partial removal of the binder at the surface of the particle.

3,958,064

MAGNETIC RECORDING TAPE

Roger A. Brekken, Hastings; Edgar L. Evans, Woodbury, and George F. Olson, Oakdale, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 155,353, June 21, 1971, abandoned. This application Jan. 17, 1972, Ser. No. 218,498

Int. Cl.[2] H01F *10/00*

U.S. Cl. 428—336 **6 Claims**

1. A coated sheet material characterized by outstanding wear resistance, scratch resistance and processability, said sheet material comprising in combination a biaxially oriented flexible polymeric film, having one comparatively smooth face and one comparatively rough face, and having coated over said smooth face thereof a thin layer of material, said film prior to coating having at its opposite surfaces, respectively,

a. a substantially particle-free smooth-surfaced first layer consisting essentially of polyethylene terephthalate and having a thickness which meets at least one of the following criteria:

1. at least 0.15 mil
2. at least 50% of the total film thickness, and

b. a particle-containing relatively rough-surfaced second layer consisting essentially of

1. a major continuous phase consisting essentially of polyethylene terephthalate and
2. a plurality of minor discontinuous phases consisting essentially of finely divided particles, not exceeding about 1/3 the total volume of said second layer, at least two of said discontinuous phases being structurally different and mutually insoluble, said polymers consisting essentially of, based on the total weight of said second layer,

a. from 1% to 6% discrete particles of at least one polymer selected from the class consisting of polypropylene, styreneacrylonitrile polymer, nylon and incompatible polyester, and

b. from 1% to 6% discrete particles of at least one polymer selected from the class consisting of polymers of lower mono-alpha-olefins, any polymer so selected being structurally different from any polymer selected under (a).

3,958,065

POLYESTER FILM COATED WITH A VINYLIDENE CHLORIDE COPOLYMER CONTAINING A LINEAR POLYESTER RESIN

Ralph Oliver Ranck, Richmond, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 377,087, July 6, 1973, Pat. No. 3,896,066, which is a continuation-in-part of Ser. No. 356,442, May 2, 1973, abandoned. This application Jan. 13, 1975, Ser. No. 540,437

Int. Cl.[2] B65D *85/72;* **B32B** *27/36, 27/30*

U.S. Cl. 428—349 **14 Claims**

1. In a process for the manufacture of a coated polyester film wherein a coating bath containing a copolymer of vinylidene chloride and at least one other ethylenically unsaturated monomer, in solvent, is applied to a polyester film, followed by drying of the coated film to remove the solvent, the improvement wherein bonding between the vinylidene chloride copolymer and polyester film is improved by adding to the coating composition about 0.1 to 6% by weight, based on said vinylidene chloride copolymer, of a linear film-forming polyester resin having a molecular weight of at least about 500 prepared by condensing a glycol and a polyfunctional acid, at least 70% by weight of said polyfunctional acid being an aromatic polyfunctional acid.

6. A polyester film having on at least one surface thereof a continuous adherent, tack-free, heat-sealable, barrier coating containing:

1. a copolymer of vinylidene chloride and at least one other ethylenically unsaturated monomer copolymerizable therewith, said copolymer containing at least 80% by weight of vinylidene chloride, and
2. about 0.1 to 6% by weight, based on said vinylidene chloride copolymer, of a linear film-forming polyester having a molecular weight of at least about 500 prepared by condensing a glycol and a polyfunctional acid, at least 70% by weight of said polyfunctional acid being an aromatic polyfunctional acid.

3,958,066

CONDUCTIVE SYNTHETIC FIBERS

Kazuyoshi Imamura; Tatsuo Ishikawa, and Tetsuhiro Kusunose, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 31, 1973, Ser. No. 365,497

Claims priority, application Japan, June 8, 1972, 47-56444

Int. Cl.[2] D06M *11/12*

U.S. Cl. 428—372 **11 Claims**

1. Conductive synthetic fibers having an electric resistivity of 10^5 Ω/cm or less, and consisting of fibers of thermoplastic synthetic polymer and, adhered directly to the surface thereof, a substantially continuous layer consisting of oxidized metal particles, wherein said metal particles are oxidized in the broad sense, produced by a process comprising

1. heating sheath-core synthetic fibers wherein the sheath has a lower melting point than the core to soften the sheath,
2. depositing metal powder upon the heat-softened sheath,
3. cooling the sheath to bind the metal particles which were deposited thereon when it was in a heat-softened state, and
4. subjecting the atmosphere-exposed bound metal particles to an oxidation treatment in a broad sense.

6. A method for producing conductive fibers having an electric resistivity of 10^5 Ω/cm or less which comprises (1) heating sheath-core synthetic fibers wherein the sheath has a lower melting point than the core to soften the sheath, (2) depositing metal powder upon the heat-softened sheath, (3) cooling the sheath to bind the metal particles which were deposited thereon when it was in a heat-softened state, and (4) subjecting the atmosphere-exposed bound metal particles to an oxidation treatment in a broad sense.

3,958,067

GRANULAR ASPHALTS

Takashi Takase, Narashino; Tsunekazu Hayashi, Mitaka, and Hirokazu Saitoh, Ohmiya, all of Japan, assignors to Mitsuboshi-Sangyo Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 151,571, June 9, 1971, Pat. No. 3,783,000. This application Oct. 3, 1973, Ser. No. 403,075

Claims priority, application Japan, June 11, 1970, 45-49845; June 11, 1970, 45-49846; June 11, 1970, 45-49847

Int. Cl.² B32B 5/16

U.S. Cl. 428—402 6 Claims

1. A granular asphalt having a grain size of from about 0.074 to about 10 mm and being in the shape of a polyhedron having at least one acute angle.

3,958,068

PROCESS FOR THE PRODUCTION OF POWDERED MAGNETIC MATERIAL

Shinji Umeki, Tokyo, and Fujio Shibata, Yachiyo, both of Japan, assignors to TDK Electronics Company, Limited, Tokyo, Japan

Filed May 30, 1972, Ser. No. 257,716

Claims priority, application Japan, May 27, 1971, 46-35860

Int. Cl.² H01F 1/06

U.S. Cl. 428—403 9 Claims

1. A process for making magnetic powder adapted for use as a magnetic recording medium which comprises:

providing a dispersion of finely divided particles consisting essentially of solid ferromagnetic oxide in an aqueous solution of ferromagnetic metal salt;

reacting the ferromagnetic salt with a water soluble reducing agent during agitation to precipitate the ferromagnetic metal and form a free metal coating on the particles; and

recovering coated particles having enhanced coercive force and magnetic flux.

3,958,069

CELLULOSE-POLYMER COMPOSITES

Norman G. Gaylord, New Providence, N.J., assignor to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 32,736, April 28, 1970, Pat. No. 3,765,934. This application Mar. 22, 1973, Ser. No. 343,923

Int. Cl.² B32B 21/02, 27/04, 27/28; B29J 5/04

U.S. Cl. 428—407 13 Claims

1. A process for the preparation of a molded object which comprises impregnating particles of a porous, cellulosic material with a polymerizable equimolar complex of styrene and maleic anhydride, molding said impregnated particles into an object and thereafter subjecting said complex in situ to non-catalytic polymerization, the anhydride groups in the resultant polymer reacting with cellulosic hydroxyl groups whereby bonds are formed between the polymer and said cellulosic material.

12. A molded object obtained by the process of claim 1.

3,958,070

DECORATIVE METALLIC ARTICLES WITH DIFFERENTLY COLORED SURFACE ZONES

Wilfried Schintlmeister, Reutte, and Oskar Pacher, Muehl-Reutte, both of Austria, assignors to Schwarzkopf Development Corporation, New York, N.Y.

Filed June 10, 1974, Ser. No. 477,842

Claims priority, application Austria, June 22, 1973, 5482/73

Int. Cl.² C23C 29/00; C23D 5/06

U.S. Cl. 428—408 11 Claims

1. An article of jewelry having differently colored surface zones, said metal article consisting essentially of a base member having on its surface at least one surface zone that is differently colored from the balance of said surface and is made of a hard material selected from the carbides, carbonitrides, silicides, nitrides and borides of the elements of Groups III–VI of the Periodic Table said differently colored surface zones being arranged so that they are in the form of a decorative pattern.

3,958,071

ELECTRICAL RESISTOR AND METHOD OF PRODUCING SAME

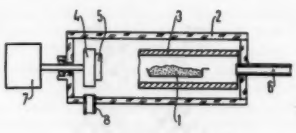
Konrad Hieber, Munich, and Alfred Politycki, Ottobrunn, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 26, 1973, Ser. No. 335,666

Claims priority, application Germany, Mar. 6, 1972, 2210742

Int. Cl.² C23C 11/00, 11/02

U.S. Cl. 428—411 8 Claims



1. A method for producing electrical resistor comprising a layer disposed on a substrate, said layer having a metal component selected from a metal and metal alloy and a carbon component wherein the temperature coefficient of the resistivity and the specific resistivity of the layer are influenced by the amount of carbon introduced into the layer, said method comprising the steps of providing at least one metal-organic compound selected from a group consisting of a metal acetylacetonate and mixtures of metal acetylacetonates and a substrate in a vacuum chamber; heating the metal-organic compound to evaporate a gas phase of the compound; providing a carrier gas selected from a group consisting of hydrogen, ammonia and a mixture of hydrogen and nitrogen under pressure, introducing the carrier gas into the chamber for transporting the gas phase of the metal organic compound to the substrate upon which the layer is to be deposited; and heating the substrate to a temperature in a range of 250° to 600°C to cause a thermic decomposition of the gas phase of the metal-organic compound to deposit a layer consisting of the metal component and the carbon, whereby said pressure of the carrier gas is such that both carbon and the metal component are deposited and the amount of carbon present in the layer depends upon the temperature of the substrate.

7. An electrical resistor produced by the method of claim 1, wherein the temperature coefficient of resistivity of the layer is in the range of +100 through −500 ppm/degree.

8. An electrical resistor produced by the method of claim 1, wherein the specific resistivity is within a range of 100 $\mu\omega$ cm up to 10^5 $\mu\omega$ cm.

3,958,072

CURED POLYESTER PRODUCT

Kunio Araki; Kazuo Gotoh, and Takashi Sasaki, all of Takasaki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Jan. 3, 1973, Ser. No. 320,741
Int. Cl.² B32B *31/06, 31/12, 31/28, 27/36*
U.S. Cl. 428—414 11 Claims

1. A process for preparation of a laminated article comprising:

coating or impregnating a substrate with a composition consisting essentially of a liquid ethylenically unsaturated polyester resin and 0.5–30% by weight of an ethylenically unsaturated monomer having at least one epoxy group,

covering said liquid ethylenically unsaturated polyester resin with a film of a saturated polyester resin whose surface facing said composition has been previously activated for promotion of adhesion; and

curing said composition.

7. In a cured resin product comprising a polyester resin layer laminated on or impregnated in a substrate, and a covering film laminated on the surface of the resin layer, the improvement wherein:

said polyester resin layer is prepared by curing a composition consisting essentially of a liquid ethylenically unsaturated polyester resin and 0.05–30% by weight of ethylenically unsaturated monomer having at least one epoxy group, said curing taking place on the substrate and after the placement of the covering film, and said covering film comprising a saturated polyester resin, the surface of which, facing the polyester resin layer, having been previously activated for promotion of adhesion.

3,958,073

PROPERTIES OF GLASS SURFACES

Gianfranco Trevisan, Fidenza; Francesco Mascaro, Pizzighettone, and Corrado Brichta, Milan, all of Italy, assignors to Fidenza S.A. Vetraria S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 110,278, Jan. 27, 1971, abandoned. This application July 9, 1973, Ser. No. 377,655
Claims priority, application Italy, Jan. 29, 1970, 19920/70
Int. Cl.² B32B *17/10;* C03C *17/30*
U.S. Cl. 428—427 15 Claims

1. Process for imparting to glass surfaces a greater hydrolytic and chemical resistance, with water-repelling properties and improved mechanical characteristics, wherein the glass surface is treated with an organoborosiloxane polymer substituted by one or more radicals selected from the group consisting of alkyl, aryl, alkoxy and acyl radicals, said radicals being the same or different, said organoborosiloxane polymer containing no free hydroxyl groups, in the presence of one or more organic Ti, Zr, Sn, V compounds, and whereby the stoichiometric ratio of the metal to boron is comprised between 1:1 and 10:1, at a temperature of the glass comprised between 200° and C, C. to thereby obtain a reaction product from the reaction between the organoborosiloxane polymer and the organic compound containing metal atoms, said reaction product being in the form of an extremely thin layer chemically grafted onto the glass surface.

15. Glass surfaces treated according to the process of claim 1.

3,958,074

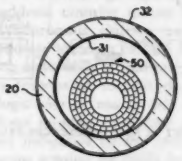
ELECTRIC POWER TRANSMISSION LINE

Perry P. Pirooz, Toledo, Ohio; Anthony P. Schmid, Riga, Mich., and Dennis T. Sturgill, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 415,919, Nov. 14, 1973. This application June 27, 1975, Ser. No. 591,207

Int. Cl.² H01B 7/34

U.S. Cl. 174—15 C 2 Claims



1. A glass insulated electrical power transmission line comprising: at least one dielectric glass casing having inner and outer surfaces, said casing being made of a plurality of monolithically formed hollow cylindrical glass tube sections hermetically fused together end to end in series to form a casing capable of electrically insulating a conductor having a power-carrying capacity of 50 megawatts, said casing having a length to outside diameter ratio in excess of 200:1, an electrical power transmission conductor within said casing extending from one end of said casing to the other end thereof said conductor having a power-carrying capacity of 50 megawatts, a semiconductive material means on the inner surface of said casing for bringing said surface to an electrical potential substantially equal to that of said conductor, a duct for containing a cooling fluid surrounding and in direct contact with said casing, said cooling fluid being basically of water, and means for causing said coolant to flow along the length of said casing.

3,958,075

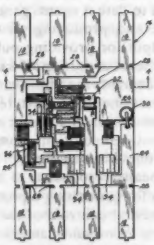
HIGH POWER THICK FILM CIRCUIT WITH OVERLAPPING LEAD FRAME

Lance R. Kaufman, Milwaukee, Wis., assignor to Gentron Corporation, Milwaukee, Wis.

Filed Nov. 11, 1974, Ser. No. 522,564

Int. Cl.² H01B 7/34

U.S. Cl. 174—16 HS 2 Claims



1. In a thick film electrical circuit including an insulating face plate and thick film conductors adhering to one surface of said face plate, the improvement wherein there are electrically conductive external leads which are of substantially greater thickness than the thick film conductors and which have integral inwardly extending strip portions of said greater thickness and of low thermal resistance, some of said strip portions overlying selected thick film conductors in electrical contact therewith and in laminated relationship to substantially increase the current carrying capacity thereof, and at least one heat generating semi-conductor component mounted directly on an inwardly extending strip portion from said external leads whereby one contact of said semi-conductor component is electrically connected to said strip portion by said mounting, said last mentioned strip portion being of greater area than other strip portions and of greater area than said semi-conductor component thereon, and the laminated relationship of said last mentioned strip portion on the thick film conductor portion therebelow providing for lateral thermal heat diffusion from said component into said strip portion whereby heat diffusion through the insulating face plate occurs over a substantially greater area than the area occupied by the heat generating component, and means electrically connecting another contact of said semi-conductor to another strip portion.

3,958,076

SPACER DAMPER FOR OVERHEAD POWER TRANSMISSION LINES

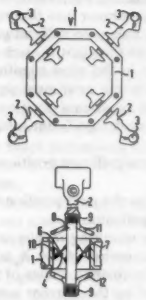
Edwin Barclay Moore, Leicestershire, and Thomas John Smart, Oadby, both of England, assignors to Dunlop Limited, London, England

Filed Mar. 3, 1975, Ser. No. 554,523

Claims priority, application United Kingdom, Mar. 12, 1974, 10912/74

Int. Cl.² H02G 7/14, 7/12

U.S. Cl. 174—42 20 Claims

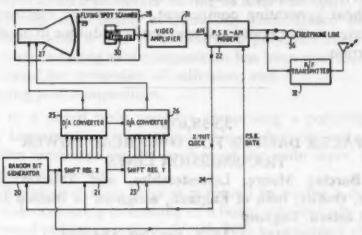


1. A spacer-damper for a sub-conductor bundle of two or more sub-conductors comprising a substantially rigid body member, an arm for attaching each sub-conductor to the body member, each arm provided with clamp means at one end, the clamp means having a groove extending in the direction of the axis of the sub-conductor bundle for attachment to one of the sub-conductors, and a connection between the other end of each arm and the body member wherein the connection comprises a damped resilient member providing damped resilient movement in all directions of arm movement, and wherein the maximum ratio between stiffnesses of the resilient member in any two directions is ten to one.

3,958,077
PICTURE TRANSMISSION SYSTEMS

John Ross, Claremont, and Amedeo Filiberto Sala-Spini, Morley, both of Australia, assignors to The University of Western Australia, Nedlands, Australia

Filed Oct. 31, 1974, Ser. No. 519,695
Claims priority, application Australia, Oct. 31, 1973, 5483/73
Int. Cl.² H04N 3/30
U.S. Cl. 178—6 **6 Claims**



1. In a picture transmission system in which every picture element is considered to be addressable in an X-Y plane and the picture is scanned according to X and Y coordinate values specifying the address of a scanning means, means for scanning the picture in a random manner comprising an X shift register and a Y shift register connected serially, a random bit generator, means for shifting each random bit as it is received from the random bit generator into the most significant position of the X register, means to shift all previous bits in both registers one position to the right in such a way that

a. the bit previously in the most significant position of the X register moves to the next most sigificant position,

b. the bit in the least significant position within the X register moves to the most significant position of the Y register,

c. the bit in the least significant position of the Y register is discarded, and

d. all other bits shift to the next position to the right, thereby becoming less significant,

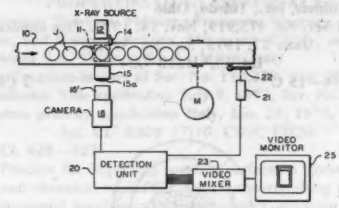
means to position the scanning means according to the address defined by the contents of the X and Y shift registers, means to encode the luminance values of the picture element at the position defined by the current contents of the X and Y shift registers, and means for transmitting each bit output of the random bit generator along with the said luminance values.

3,958,078
X-RAY INSPECTION METHOD AND APPARATUS

Robert Z. Fowler; Bruno W. Hautaniemi, both of Ithaca; Edgar W. Seymour, Freeville, and Hans G. Jorgensen, Ithaca, all of N.Y., assignors to Ithaco, Inc., Ithaca, N.Y.

Filed Aug. 30, 1974, Ser. No. 502,083
Int. Cl.² H04N 7/18
U.S. Cl. 178—6.8 **51 Claims**

1. X-ray inspection apparatus, comprising, in combination: first means for irradiating an article to be inspected with x-ray radiation to derive an optical image having a brightness variation characteristic of the radiation absorption of said article; means for scanning said optical image with a plurality of successive scan lines to derive a respective plurality of line scan signals; means for comparing each of said line scan signals with at least one prior one of said line scan signals of said plurality to detect differences between said signals; and means for providing a reject indication signal if the magnitudes of a

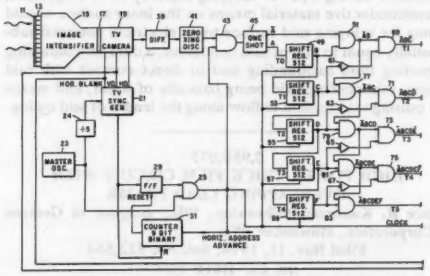


predetermined number of said differences exceed a tolerance value.

3,958,079
REAL TIME, TV-BASED, POINT-IMAGE QUANTIZER AND SORTER

Arthur L. Case, and Jackson B. Davidson, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 25, 1975, Ser. No. 571,443
Int. Cl.² H04N 7/18; G06M 11/02
U.S. Cl. 178—6.8 **4 Claims**



1. In a television-based, two-dimensional radiation detection system wherein a target is scanned in a horizontal raster by a television camera to detect events generated by radiation impinging said target and producing an event image, said camera having an output for providing pulses corresponding to the detection of at least a portion of said event images as the camera target is scanned, the improvement comprising:

a plurality of series connected shift registers, each shift register having an identical number of bits equal to a selected incremental resolution along each horizontal scan line of said television camera;

pulse generating means responsive to said output pulses from said camera for generating a prompt signal coinciding with the horizontal centroid of the event images producing said pulses from said camera and applying said prompt signal to a first one of said series of shift registers by setting the front bit therein;

clock pulse generating means for synchronously shifting each of said shift registers at a clock rate corresponding to the horizontal scanning speed of said camera so that the set bit of said first register is continuously shifted through said pluarality of series-connected shift registers one at a time during horizontal scanning;

a presettable vertical address counter means for counting horizontal blanking pulses from said television camera from a preset number to register delayed vertical address numbers corresponding to the vertical centroid of event

images as said scanning beam is shifted vertically along said target;

logic circuit means for sensing coincidence of set bit locations of said plurality of series-connected shift registers with said prompt signal output of said pulse generating means to determine the vertical extent of overlap of said event image of adjacent horizontal scans and generating a store command signal at an output thereof after said coincidence ceases at a time indicative of the centroid location of said event image registered by said counter;

a horizontal address counter means for counting pulses from said synchronous shifting means to register the horizontal address location of said scanning beam horizontally along each scan of said target; and

storage means responsive to said store command signal from said logic circuit means for storing the delayed vertical address number registered by said vertical address counter indicative of the centermost one of said horizontal scans sensing an event image and storing the horizontal address number registered by said horizontal address counter indicative of the horizontal centroid location of said event image.

3,958,080

VISUAL INSPECTION APPARATUS FOR CONDUITS

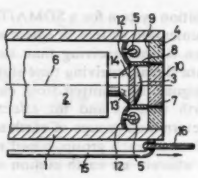
Walter Schadler, Triesen, Liechtenstein, assignor to Josef Kaiser AG Fahrzeugwerk, Schaanwald, Liechtenstein

Filed June 5, 1975, Ser. No. 584,150

Claims priority, application Switzerland, June 11, 1974, 7935/74

Int. Cl.² H04N 7/18, 5/26

U.S. Cl. 178—7.91 **10 Claims**



1. Visual inspection apparatus comprising:

a. a protective housing elongated in a predetermined direction,

1. said housing defining a cavity therein and having a transverse end wall bounding said cavity in said direction,

2. said end wall having a plurality of transparent portions offset from each other transversely of said direction,

3. said end wall having an inner face directed toward said cavity and an outer face, said faces being transverse to said direction;

b. an objective lens system in said cavity aligned with one of said portions in said direction;

c. a light source in said cavity aligned with another transparent portion of said end wall in said direction;

d. an opaque partition in said cavity interposed between said light source and said objective lens system, said partition extending inward of said cavity from said inner face and shielding said objective lens system from the light of said source,

1. said end wall havng an opaque zone interposed between said portions thereof and preventing passage of light from said light source through said portions to said objective lens system, said zone extending from said inner face toward said outer face,

2. said partition being aligned with said zone in said direction; and

e. camera means in said cavity and associated with said objective lens system for producing an image in response to light received by said objective lens system through said one portion.

3,958,081

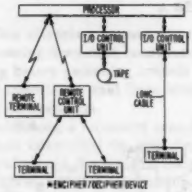
BLOCK CIPHER SYSTEM FOR DATA SECURITY

William Friedrich Ehrsam, Hurley; Carl H. W. Meyer, Kingston; Robert Lowell Powers, West Hurley; Paul Norman Prentice, Hyde Park; John Lynn Smith, and Walter Leonard Tuchman, both of Woodstock, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 24, 1975, Ser. No. 552,685

Int. Cl.² H04K 1/00

U.S. Cl. 178—22 **16 Claims**



1. A device for ciphering a message block of data bits under control of a set of cipher key bits by a predetermined number of iteration operations, said cipher device comprising:

first store means storing a first half of said message block of data bits,

second store means storing a second half of said message block of data bits,

control means including third store means storing said set of cipher key bits, and

first linear transformation means connected to said third store means producing a permuted set of cipher key bits from said set of cipher key bits,

expansion means connected to said first store means duplicating predetermined ones of the data bits of the first half of said message block to produce an expanded first half of said message block containing data bits equal in number to the number of cipher key bits in said permuted set of cipher key bits,

means connected to said expansion means and said control means carrying out a substitution transformation function in accordance with the data bits of said expanded first half of said message block and the cipher key bits of said permuted set of cipher key bits to produce a substitution set of bits equal in number to the number of bits in the first half of said message block,

second linear transformation means connected to said substitution transformation means producing a permuted substitution set of bits,

the combined transformation performed by said substitution transformation means and said second linear transformation means resulting in a product block cipher of the first half of said message block,

means connected to said second store means and said second linear transformation means modifying the data bits of the second half of said message block in accordance with the product block cipher of the first half of said message block to produce a set of bits representing a modified second half of said message block,

means connected between said modifying means and said first store means to load said modified second half of said message block from said modifying means into said first store means, and

means connected between said first store means and said second store means to load the first half of said message block from said first store means into said second store means concurrently with said modified second half of said

message block being loaded into said first store means to complete a first iteration operation of said cipher device.

3,958,082

CIRCUIT ARRANGEMENT FOR CONTROLLING OF AMPLIFICATION DEVICES IN A SEMI-DUPLEX DATA SIGNAL TRANSMISSION SYSTEM

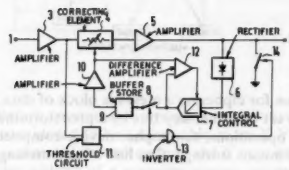
Josef Huellwegen, Altenbeken, Germany, assignor to Nixdorf Computer AG, Paderborn, Germany

Filed Jan. 13, 1975, Ser. No. 540,446

Claims priority, application Germany, Mar. 13, 1974, 2412127; Oct. 24, 1974, 2450633

Int. Cl.² H04L 5/16

U.S. Cl. 178—58 A 13 Claims



1. In a circuit arrangement for controlling of amplification devices in the semi-duplex data signal transmission system, comprising an integral control which is controlled by a normal magnitude signal derived from the output of a respective amplification device in the data signal transmitting path, which integral control delivers a control signal for adjusting a correcting element in the data signal transmitting path to effect an adjustment of an amplification factor, the improvement comprising a buffer store having an input terminal and an output terminal, a switch controllable depending on the level of the arriving data signals series connected to the input terminal, the output terminal being connected to the correcting element and to a difference amplifier, tne output signals of the buffer store and the output signals of the integral control, control the difference amplifier, which delivers a control amplitude to the integral control to hold the integral control at a specified control condition.

8. In a circuit arrangement for controlling of amplification devices in the semi-duplex data signal transmission system, comprising an integral control which is controlled by a normal magnitude signal derived from the output of a respective amplification device in the data signal transmitting path, which integral control delivers a control signal for adjusting a correcting element in the data signal transmitting path to effect an adjustment of an amplification factor, the improvement comprising an integral control having an input terminal and an output terminal, a first switch controllable dependent from the level of the arriving data signals series connected to the input terminal, the output terminal being connected to the correcting element, the integral control including an operational amplifier having a capacitance storing the normal magnitude signal and is maintained at a fixed reference voltage (V_F) at the input.

3,958,083

ACQUISITION SYSTEM FOR THE SDMA/TDMA SATELLITE COMMUNICATION SYSTEM

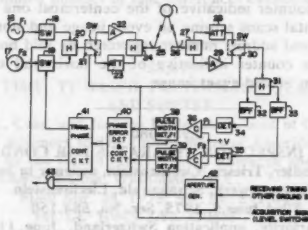
Takao Hara, Yokohama; Yoshikazu Tsuji, Kawasaki, and Yasuhiko Sakamoto, Fujisawa, all of Japan, assignors to Fujitsu Ltd., Japan

Filed Feb. 21, 1975, Ser. No. 551,675

Claims priority, application Japan, Feb. 26, 1974, 49-22619; Feb. 26, 1974, 49-22621

Int. Cl.² H04J 3/06; H04B 7/20

U.S. Cl. 178—69.5 R 3 Claims



1. An acquisition system for a SDMA/TDMA satellite-earth station communication system in which a satellite provides a synchronization signal receiving time slot sequential with a plurality of data signal receiving time slots, for returning synchronization signals transmitted from earth stations to their respective earth stations and for effecting communication between predetermined groups of earth stations and between the earth stations of each group, based on a timing signal of said satellite, wherein an earth station of said system comprises:

means for transmitting an acquisition signal in a transmit time slot, said acquisition signal is composed of a plurality of signal burst portions, and said transmitting means includes means for shifting said transmit time slot in a selected sweep mode;

means for receiving said acquisition signal returned from said satellite, said receiving means includes a phase error detection means for detecting and measuring the amount of phase error between said received acquisition signal and said synchronization signal receiving time slot; and

transmit phase control means for receiving said measured phase error and selecting said sweep mode from a plurality of sweep modes, whereby said transmit time slot is shifted in accordance with said measured phase error and synchronization is achieved between said transmit time slot of said earth station and said synchronization signal receiving time slot of said satellite.

3,958,084

CONFERENCING APPARATUS

David C. Nicholas, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 30, 1974, Ser. No. 510,202

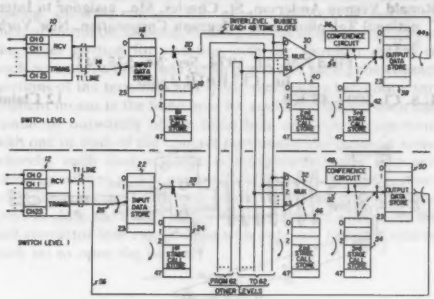
Int. Cl.² H04M 3/56

U.S. Cl. 179—1 CN 2 Claims

1. The method of conferencing a plurality of signal sources in a switching system comprising the steps of:

directing signals from all conferenced sources, other than

the receiving conferee, toward each conferee; and selecting for each conferee, from among the directed signals



to that conferee, the one signal having predetermined characteristics for receipt by that conferee.

3,958,085

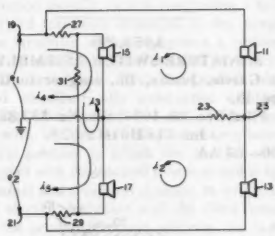
COMPATIBLE 4-2-4 ENCODING-DECODING SYSTEM

Ronald O. Barber, and Daniel J. Barnes, both of Fort Wayne, Ind., assignors to The Magnavox Company, Fort Wayne, Ind.

Continuation of Ser. No. 181,847, Sept. 20, 1971, abandoned. This application May 6, 1974, Ser. No. 467,357

Int. Cl.² H04R *5/00*

U.S. Cl. 179—1 GQ **3 Claims**



1. A passive decoding network for decoding two channel stereo signals into four channel signals comprising:

first, second, and third input terminals for receiving a first channel signal between the first and third input terminals and a second channel signal between the second and third input terminals;

a plurality of output terminals for delivering output signals to transducers; second of said terminals coupled

a first of said output terminals directly coupled to the first input terminal, a second output terminals directly coupled to the second input terminal, and a third of said output cooupled to the third input terminal through a first impedance means;

a fourth of said output terminals connected to the first input terminal through a second impedance means, a fifth of said output terminals coupled to the second input terminal through a third impedance means, and a sixth of said output terminals directly coupled to the third input terminal; and

a fourth impedance means connected between the fourth and fifth of said output terminals.

3,958,086

TELEPHONE-SIGNAL RECEIVER FOR SWITCHING EXCHANGES HAVING CENTRALIZED LOGIC CIRCUITS

Piero Calcagno, Collegno (Turin), and Enzo Garetti, Turin, both of Italy, assignors to CSELT - Centro Studi e Laboratori Telecommunicazioni SpA, Turin, Italy

Filed Oct. 22, 1974, Ser. No. 517,017

Claims priority, application Italy, Oct. 22, 1973, 70090/73

Int. Cl.² H04M *3/22*

U.S. Cl. 179—15 BY **7 Claims**

1. In a central office of a telecommunication system serving a multiplicity of incoming lines each constituted by a plurality of channels carrying binary switching criteria represented by alternating channel conditions, said lines being identified by individual codes, in combination:

timing means establishing a recurrent sampling cycle;

first register means controlled by said timing means for successively reading out the identification codes of said incoming lines during respective sampling intervals within each cycle;

decoding means controlled by said timing means and connected to said incoming lines for generating a bit for each channel of an incoming line during a sampling interval allocated thereto;

memory means storing at least one threshold value for the minimum length of each of two binary channel conditions for each channel of each of said incoming lines, said memory means being controlled by said timing means for giving out the threshold values of the several channels of any incoming line whose identification code is read out from said first register means during a sampling interval;

second register means connected to said decoding means for temporarily storing, for the duration of a sampling cycle, a bit generated during any of said sampling intervals;

coincidence means connected to said second register means and to said decoding means for determining therefrom the identity or nonidentity of a stored bit from a preceding sampling cycle with a newly generated bit;

counting means for each channel of an incoming line connected to said coincidence means for resetting in response to a determination of nonidentity, and for producing a progressively increasing count until reset;

comparison means connected to said counting means and to said memory means for comparing during each sampling interval the count from said counting means with said threshold value for each channel of the incoming line being sampled; and

processing means for carrying out switching operations under the control of said comparison means.

3,958,087

SWITCH STRUCTURE

Hans C. Mol, Wilton, Conn., and Martin G. Reade, Los Angeles, Calif., assignors to Becton, Dickinson Electronics Company, San Juan Capistrano, Calif.

Filed Sept. 4, 1969, Ser. No. 855,226

Int. Cl.² H01H *3/32, 19/14, 21/22*

U.S. Cl. 200—17 R **24 Claims**

1. A switch structure comprising:

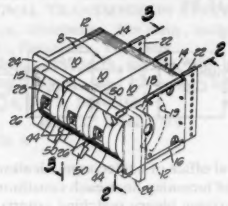
a case having an apertured face wall;

electrical contacts mounted on said case;

an indicia-carrying wheel having a plurality of indicia appearing around the rim of said wheel, said wheel being mounted for rotation in said case behind said aperture in order to present to view a selected indicium;

switch means mounted in said case adapted to selectively contact said electrical contacts as said means is rotated, thereby completing different electrical circuits in various switch positions;

a lever protruding through said aperture and being adapted to operate said switch means; and



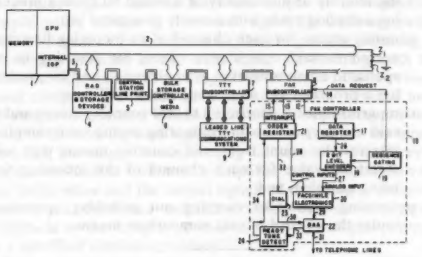
conversion means for rotating said wheel through a first angle as said lever is rotated through a second angle, said first angle being substantially larger than said second angle, said conversion means including means interconnecting said wheel and said lever for rotating said wheel clockwise about its axis when said lever rotates clockwise about its axis and for rotating said wheel counterclockwise about its axis when said lever rotates counterclockwise about its axis.

3,958,088

COMMUNICATIONS SYSTEMS HAVING A SELECTIVE FACSIMILE OUTPUT

Bruno Vieri, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 29, 1974, Ser. No. 456,201
Int. Cl.² H04N *1/32*; G06F *3/14*
U.S. Cl. 178—26 R **78 Claims**



1. A communication system comprising the combination of a plurality of teleprinter means for transmitting and receiving message information in a character coded format;

facsimile means for receiving message information in a raster scan forma; and format,

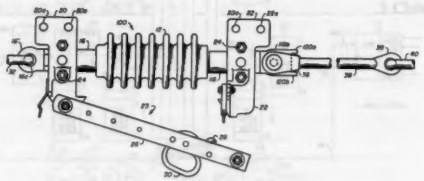
a communications link having access to said teleprinter means and to said facsimile means for conveying messages originating at one of said teleprinter means to at least one of the other teleprinter means and said facsimile means, said link including format converting means for selectively converting the format of messages destined for said facsimile means from said character coded format to said raster scan format.

3,958,089

ANTI-ROTATION DEVICE FOR POWER SWITCH ASSEMBLY

Ronald Vernon Anderson, St. Charles, Mo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 21, 1974, Ser. No. 525,941
Int. Cl.² H01H *31/00*
U.S. Cl. 200—48 KB **12 Claims**



1. A rotation reducing device for use with a power switch assembly of the type adapted for in-line mounting with a power line and of the type having a blade switch assembly and an end fitting member connected to a strain link and adapted for pivotal mounting to a clevis member of said strain link, said device comprising:

a substantially rigid member;

means for fixedly connecting said rigid member to at least one of said end fitting and clevis members; and,

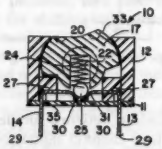
said rigid member including means extending away from said pivotal mounting and toward the other of said end fitting and clevis members for engaging the other member thereby to preclude relative rotation between said end fitting and clevis members about said pivotal mounting upon engagement of said rigid member with said other member.

3,958,090

MINIATURE SWITCH ASSEMBLY

Ricardo L. Garcia, Justice, Ill., assignor to Grayhill, Inc., LaGrange, Ill.

Filed Dec. 18, 1974, Ser. No. 533,882
Int. Cl.² H01H *13/28*
U.S. Cl. 200—67 AA **10 Claims**



1. A miniature electrical switch comprising a housing of electrical insulating material, said housing including a cover portion and a base portion, said cover portion being generally rectangular in shape and having a top wall, opposed side and end walls and being open opposite the top wall, said base portion being rectangular in form and of substantially the same rectangular form as the cover portion, switching and terminal means mountable within the housing and including a frame member of electrical insulating material supporting a plurality of juxtaposed sets of conductor terminals, each set of conductor terminals including a pair of axially aligned terminal arms having spaced apart contact portions defining an open area therebetween and terminal legs integral with said arms and extending at right angles to said arms, said switching and terminal means further including a plurality of actuators of electrical insulating material and a plurality of ball contac-

tors of electrical conducting material, openings in the cover portion for a portion of the actuators to extend therethrough to be engaged during operation of the switch, each actuator having shoulder means for permitting pivotal mounting thereof within the housing, bearing means integrally formed in the cover portion for coacting with the shoulder means of each actuator, a blind hole in each actuator facing the contact portions of the terminals and freely receiving a ball contactor, resilient means in the blind hole for resiliently urging each ball contactor outwardly of the blind hole and into engagement with one or both of the contact portions of the terminal arms, whereby each said actuator is movable between first and second positions and in one position disposes the ball contactor into engagement with both contact portions of the terminal arms to close the switch and in the other position disposes the ball contactor into engagement with only one terminal arm of each set to open the switch.

3,958,091

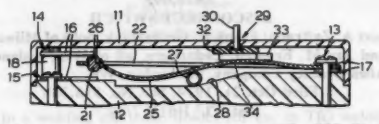
SNAP-ACTION ELECTRIC SWITCH, AND CONTACT BLADE STRUCTURE THEREFOR

Ross R. Attridge, 616 Avenue Road, Suite No. 11, Toronto, Ontario, Canada

Filed Apr. 2, 1975, Ser. No. 564,444

Int. Cl.² H01H *13/36*

U.S. Cl. 200—67 D **10 Claims**



1. A snap-action electric switch comprising a housing, first, second and third terminals mounted in the housing, and a contact blade structure which comprises a resilient, electrically conductive contact blade one end of which is fixedly mounted to the housing in electrical contact with the first terminal, and an electrically conductive contact member mounted on the other end of the contact blade in electrical contact therewith, the contact blade structure being movable between a first position in which the contact member is in electrical contact with the second terminal and is spaced from the third terminal and a second position in which the contact member is in electrical contact with the third terminal and is spaced from the second terminal, wherein the contact blade comprises an actuation portion, and a biassing portion which is integral with the actuation portion and is connected thereto at said one end of the contact blade, the contact member being disposed between the actuation portion and the biassing portion at said other end of the contact blade, the biassing portion being of resultant cyma form which urges the contact member towards electrical contact with the second terminal, a pivot member being provided with the biassing portion of the contact blade at the junction between the double curves thereof being in contact therewith, and an actuator member being movably mounted in the housing and being engageable with the actuation portion of the contact blade for movement of the contact blade structure from said first portion to said second position thereof.

3,958,092

APPARATUS FOR DISCRIMINATING BETWEEN LIQUID AND GASEOUS FLOW

Jimmie N. Hoover, 4609 Dakota, Odessa, Tex. 79762

Filed Jan. 27, 1975, Ser. No. 544,221

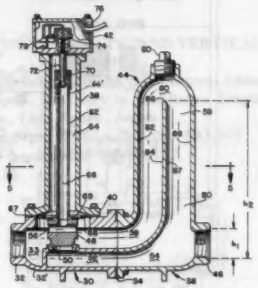
Int. Cl.² H01H *35/24*

U.S. Cl. 200—81.9 M **11 Claims**

1. Flow responsive apparatus for discriminating between liquid and gaseous flow therethrough, comprising a main housing having an inlet chamber and an outlet chamber formed therewithin; means forming a flow passageway into said inlet chamber, a valve seat, means by which said valve seat is interposed between said inlet chamber and said outlet chamber to enable flow to occur therebetween;

a riser column affixed to said housing; a tube having opposed ends, means mounting said tube for movement within said riser column such that an annulus is formed therebetween; a valve element affixed to one end of said tube; means mounting said valve element within said housing at a location which controls flow through said valve seat in response to said valve element being moved respective to said seat; means forming a flow passageway from said inlet chamber, through said valve element, through at least part of said tube, and into said annulus;

seal means interposed between said valve element and said riser column such that direct flow is precluded between said inlet chamber and said annulus;



a manifold divided into an entrance and a discharge passageway, means by which one end of said discharge passageway is flow connected to said outlet chamber, means by which one end of said entrance passageway is flow connected to said flow passageway in said valve element; means by which the remaining ends of said entrance and discharge passageways are flow connected to one another;

means mounting said manifold respective to said tube and said valve seat such that a liquid column effected within said entrance passageway is also effected within said tube, thereby causing said valve element to move respective to said seat so that liquid flow occurs through said valve seat;

and a sensor means for sensing relative movement between said valve element and said valve seat.

3,958,093

METALCLAD SWITCHGEAR USING VACUUM INTERRUPTER ELEMENTS WITH IMPROVED RESILIENT SUPPORTING MEANS

Charles M. Cleaveland, Irwin, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

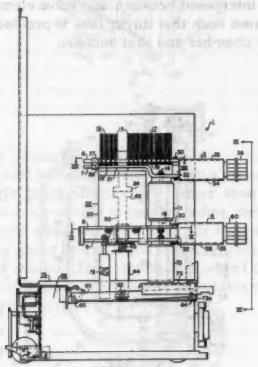
Filed May 3, 1974, Ser. No. 466,746

Int. Cl.² H01H *33/66*

U.S. Cl. 200—144 B **9 Claims**

1. A draw-out-type of circuit-breaker comprising a movable truck having a lower-disposed supporting means, a vacuum-type circuit-interrupting unit, separable contact means provided interiorly within said vacuum-type circuit-interrupting unit, a pair of post-type, side-by-side post-insulator supports extending generally parallel to one another, and extending in the same general direction, said pair of side-by-side post-insulator supports additionally being closely spaced next to each other and mechanically rigidly interconnected at at least one end thereof for combined strength and rigidity of support,

said pair of post-type insulator supports being generally parallel with the vacuum-type circuit-interrupting unit, means defining an upper stationary power-conductor assembly comprising a pair of stationary vertically closely spaced rectangularlyshaped horizontally arranged flat power bus-bar elements extending generally in the direction of truck movement, means for fixedly securing the lower stationary power busbar element of said upper stationary power-conductor assembly to the upper ends of said pair of closely spaced post-type insulator supports, a stationary contact and a stationary contact-stem extending upwardly externally of the vacuum-type circuit-interrupting unit, means for clamping the spaced stationary power bus-bar elements to said externally protruding



stationary contact-stem, an additional stationary lower-disposed power-conductor assembly comprising a pair of closely vertically spaced stationary rectangularly shaped generally-horizontally extending flat power bus-bar elements, the upper stationary power bus-bar element of said lower-disposed stationary power-conductor assembly being fixedly clamped to the lower ends of the closely spaced two post-type insulator supports, attachment means for also attaching said upper stationary power bus-bar element of the lower stationary power-conductor assembly to the lower end of said vacuum-type circuit-interrupting unit for fixedly supporting the same, and said lower-disposed supporting means of said movable truck supporting said additional lower-disposed stationary power-conductor assembly.

3,958,094

KICKOUT SWITCH AND BUZZER

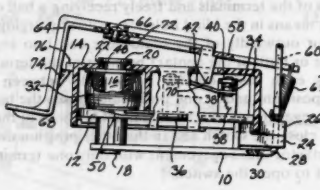
Spencer C. Schantz, 16608 W. Rogers Drive, New Berlin, and William R. Berry, W186 N6977 Mercy Road, Menomonee Falls, both of Wis.

Division of Ser. No. 402,518, Oct. 1, 1973, which is a continuation-in-part of Ser. No. 306,526, Nov. 15, 1972, Pat. No. 3,815,082. This application Sept. 6, 1974, Ser. No. 504,006

Int. Cl.[2] H01H *3/48*

U.S. Cl. 200—283 **2 Claims**

1. In an electric switch having a pair of normally closed contacts, one of said contacts being mounted on a flexible contact-supporting arm, having an actuating arm engageable with said flexible contact-supporting arm to apply pressure thereto to open said contacts, and having an elongated case enclosing said contacts and said flexible contact-supporting arm, the improvement wherein said flexible contact-supporting arm is oriented diagonally with respect to the long dimension of said case to permit an increase in length for said flexible contact-supporting arm, thereby reducing its spring rate, there being upstanding terminals, one of which projects upwardly along a first side of the case and has a right-angular extension projecting transversely of the case to a point near a second side thereof, and wherein the other terminal projects upwardly along said second side of the case and has a right-



angular extension projecting transversely of the case to a point near the first side of the case, whereby the ends of said right-angular extensions are so positioned that when the flexible contact-supporting arm is connected to one of said ends, it extends in diagonally oriented relationship toward the end of the other right-angular extension for coaction therewith.

3,958,095

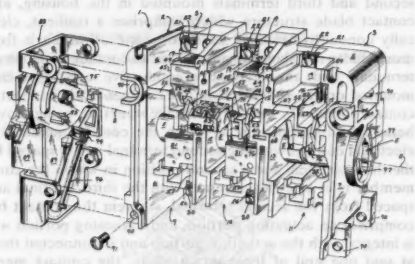
DISCONNECT SWITCH

Albert A. Zaffrann; Frank A. Grabarczyk, both of Milwaukee, and Jay M. Erdman, Cedarburg, all of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Oct. 21, 1974, Ser. No. 516,388

Int. Cl.[2] H01H *1/64*

U.S. Cl. 200—293 **11 Claims**



1. In a disconnect switch, the combination comprising:

a base having a pair of vertical side walls which define a housing and vertical divider walls which define a plurality of compartments within said housing;

a crossbar mounted to said base for rotation about a horizontal actuation axis, said crossbar extending horizontally through said compartments;

a plurality of current conducting poles, one disposed within each compartment and each pole including a movable contact blade which fastens to said crossbar and swings about said actuation axis between an opened and closed position when said crossbar is rotated about said actuation axis;

an auxiliary chamber formed in said base between a pair of said current conducting poles; and

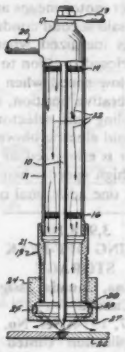
an auxiliary contact cartridge slidably received in said auxiliary chamber and including a cam member which couples to said crossbar and operates a set of auxiliary contacts within said auxiliary contact cartridge when said crossbar is rotated about said actuation axis.

3,958,096

WELDING ARC GAP IONIZATION DEVICE

George M. Schweikhardt, Richland, Wash., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 23, 1974, Ser. No. 535,240
Int. Cl.² B23K 35/38; G21F 5/02
U.S. Cl. 219—75 3 Claims



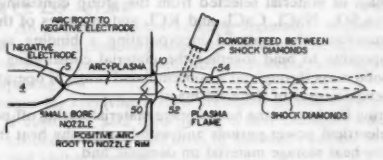
1. In a welding electrode holder for use in TIG welding a workpiece, the welding electrode holder including an electrode holding structure, a hollow tubular shroud having one end connected to the electrode holding structure and an opposite open end, and an electrode centrally positioned in the electrode holder and shroud with the electrode having a tip extending outside of the open end of the shroud, the electrode holding structure and shroud being formed so that an inert gas applied to the electrode holder is directed out of the open end of the shroud and between the electrode tip and the workpiece, the improvement for providing an ionized welding arc path between the electrode tip and the workpiece, comprising, an isotope holding structure formed on the inside of the tubular shroud at the open end thereof, and an alpha emitting isotope positioned on said isotope holding structure so that alpha particles from said alpha emitting isotope enter the gap between the electrode tip and the workpiece and provide an alpha particle welding arc path therebetween.

3,958,097

PLASMA FLAME-SPRAYING PROCESS EMPLOYING SUPERSONIC GASEOUS STREAMS

Arthur J. Fabel, Amherst, Mass., and Herbert S. Ingham, Jr., Northport, N.Y., assignors to Metco, Inc., Westbury, N.Y.

Filed May 30, 1974, Ser. No. 474,832
Int. Cl.² B23K 5/00
U.S. Cl. 219—76 7 Claims



1. A process for high velocity plasma flame-spraying of a powder onto a workpiece which comprises:

a. Passing a plasma gas through the nozzle of a plasma flame-spraying gun at an unlit gas velocity of at least 90 meters per second;

b. Striking an electric arc having at least 15 kilowatts power within said gun and disposing said arc between an electrode within said gun and a portion of said nozzle and a portion of said nozzle and regulating the gas velocity in relationship to the length of the nozzle and the diameter of the bore of said nozzle to maintain said arc on the exit rim of said nozzle;

c. Maintaining a gas back pressure within said nozzle of at least 1 atmosphere gauge whereby there are created zones of compression and zones of rarefaction coterminously in the resultant flame;

d. Maintaining an ignited plasma gas enthalpy at the exit of said nozzle of at least 7,000 joules per standard liter of gas; and

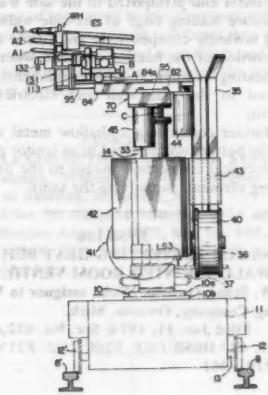
e. Introducing powder into the zones of rararefaction of said resultant flame.

3,958,098

APPARATUS FOR AUTOMATIC AND VERTICAL FILLET WELDING

Shimpei Iizuka; Keiichi Ishimoto, and Katsumi Ishimoto, all of Yokosuka, Japan, assignors to Sumitomo Shipbuilding & Machinery Co., Ltd., Tokyo, Japan

Filed Sept. 3, 1974, Ser. No. 503,048
Int. Cl.² B23K 9/12
U.S. Cl. 219—126 13 Claims



1. Apparatus for automatic and vertical fillet welding, comprising combination

a. a vehicular carriage;

b. a telescopically extendable and retractable support unit operatively connected to said carriage;

c. a lateral slide unit comprising a first slide guide operatively connected to said support unit and a lateral slide slidably mounted on said first slide guide;

d. a longitudinal slide unit operatively connected to said lateral slide and comprising a second slide guide and a longitudinal slide mounted on said second slide guide;

e. a welding head operatively connected to the end of said longitudinal slide and comprising a plurality of welding torches vertically spaced relative to one another;

f. a rotatable table operatively connected to the top of said telescopic support unit and to said first slide guide of said lateral slide unit; and

g. a hydraulic pump circuit on said carriage including means for circulating fluid to said telescopic support unit, said circuit having control means for controlling fluid flow from the latter, so as to retract the telescopic support unit

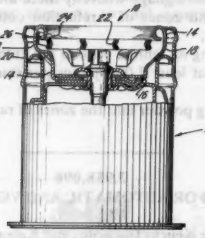
substantially at a constant speed while the welding bead is effecting a welding procedure.

3,958,099

ELECTRICAL RESISTANCE UNIT FOR IGNITOR PLUGS

Donald J. Mattis, Norwalk, Conn., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Sept. 9, 1975, Ser. No. 611,681
Int. Cl.² F23Q 7/22
U.S. Cl. 219—270 **5 Claims**



1. An electrical igniting unit for ignitor plugs and the like comprising in combination:

a. an annular metal holder having relatively thin side walls,

b. a heating element disposed in said holder and having a short outer end juxtaposed to the side walls thereof,

c. the entire leading edge of the side walls of the holder being inwardly crimped over and firmly sandwiching an end portion of the heating element, whereby the end of the heating element is both permanently mechanically secured to the side wall and electrically connected thereto,

d. the holder comprising a shallow metal cup adapted to have its bottom wall secured to an ignitor plug body, and

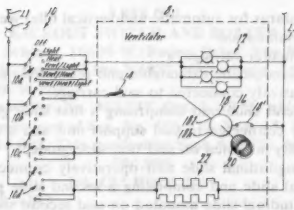
e. an electrical connection means to the other end of the heating element, supporting the same.

3,958,100

MEANS FOR PREVENTING HEAT BUILD-UP IN A WALL-MOUNTED ROOM VENTILATOR

Thomas W. Stone, Owosso, Mich., assignor to Ventrola Manufacturing Company, Owosso, Mich.

Filed Jan. 11, 1974, Ser. No. 432,498
Int. Cl.² H05B 1/02; F24F 7/02; F21V 29/00
U.S. Cl. 219—361 **5 Claims**



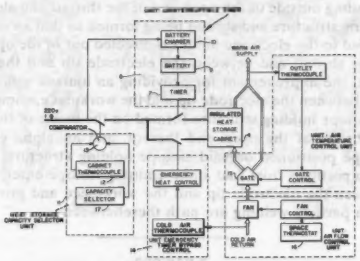
1. Means for preventing heat build-up in a wall-mounted room ventilator apparatus, said ventilator apparatus being of the type comprising an electrically powered blower means, an electrically powered heater means and an electrically powered lighting means and including a selector switch means selectively operable to each of a plurality of operative positions including a first operative position wherein operation of only said lighting means is selected, a second operative position wherein operation of only said heater means is selected, and at least one additional operative position wherein at least said blower means continuously operates, said means for preventing heat build-up comprising: a two speed electric blower motor means for powering said blower means having a first conductor which provides a high operating speed when energized and a second conductor which provides a low operating speed when energized; a normally open thermostatic switch means positioned in said ventilator apparatus to sense temperature, said thermostatic switch means being actuated to a closed position when it senses a temperature exceeding a predetermined level; first coupling means operatively coupling said thermostatic switch means with said second conductor of said electric blower motor means and with said selector switch means such that said second conductor of said electric blower motor means is inergized when said thermostatic switch is actuated to a closed position to operate said blower means continuously at low speed when said selector switch means is in said first operative position, and second coupling means operatively coupling said selector switch means with said first conductor of said electric blower motor means such that said first conductor is energized to operate said blower means continuously at high speed when said selector switch means is in said at least one additional operative position.

3,958,101

SPACE HEATING USING OFF-PEAK ELECTRIC HEAT STORAGE

Miklos F. Barabas, Regina, Canada, assignor to Saskatchewan Power Corporation, Canada

Filed Mar. 7, 1974, Ser. No. 449,095
Claims priority, application United Kingdom, Mar. 8, 1973, 11313/73
Int. Cl.² H05B 1/02; F24H 7/04
U.S. Cl. 219—365 **15 Claims**



1. A method of heating which comprises:

storing heat generated by means of electricity in a solid mass of material selected from the group consisting of Na_2SO_4, NaCl, $CaCl_2$ and KCl, and mixtures of these materials, the material incorporating a binding agent operable to bind together the material constituting the solid mass throughout a contemplated range of operating temperatures of the solid mass;

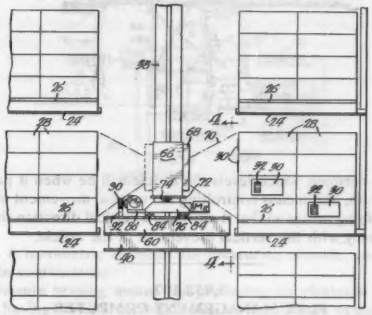
storing the heat in the heat storage material during off-peak electrical power periods and withdrawing the heat from the heat storage material on demand; and

operating the heat storage material in a solid form without appreciable physical deterioration throughout a temperature range of about room temperature to about 1200°F.

3,958,102
INVENTORY TAKING SYSTEM FOR AN AUTOMATIC WAREHOUSE

Harold S. Burt, Mendota, Ill., assignor to Conco Inc., Mendota, Ill.

Filed Oct. 21, 1974, Ser. No. 516,627
Int. Cl.² G06K *7/015, 7/14;* **B65G** *47/00*
U.S. Cl. 235—61.6 R **17 Claims**



1. An inventory taking system for an automatic warehouse, comprising:

a storage framework defining a plurality of spaced load supports, each load support being identifiable by an address;

a load carrier movable along a travel zone adjacent the storage framework and including a transfer device extendable to deposit on and withdraw from the load support a load, each load being marked with an inventory indicia;

an inventory scanner on the load carrier for reading the inventory indicia as the load carrier is moved past the loads stored in the storage framework;

an inventory pallet carried by the transfer device as the load carrier is movable along the travel zone, the inventory scanner being mounted to the inventory pallet and having cable means for connecting the scanner to the load carrier;

address means for identifying the address at which the transfer device is located; and and for recording the inventory indicia read by the inventory scanner with the address identified by the address means as the load carrier is driven past each load support.

3,958,103
AUTOMATIC TICKET VENDING SYSTEM

Akira Oka, Kyoto; Noriaki Minami, Osaka; Sigehiro Kondou, Kyoto; Hirosi Nakatsuka, Kyoto; Hirosi Egasira, Kyoto; Mamoru Hirayama, Osaka; Yasunori Hayasi, and Kazunobu Otsukawa, both of Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed May 23, 1974, Ser. No. 472,672
Claims priority, application Japan, May 31, 1973, 48-61497
Int. Cl.² G07F *1/06;* **G06K** *1/12, 7/08*
U.S. Cl. 235—61.8 R **2 Claims**

1. An automatic ticket vending apparatus, responsive to cards having a monetary value, for dispensing tickets useful in automatic ticket gate commutation systems, said apparatus comprising:

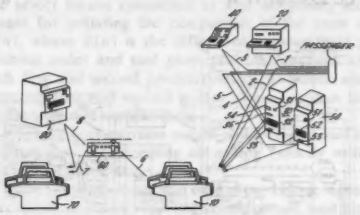
means for receiving a card presented to said apparatus by a customer, said card having a first monetary value recorded thereon in the form of machine readable symbols and visible symbols;

means for reading said first monetary value on said presented card;

means for entering into the apparatus a second monetary value corresponding to the value of the trip desired by the customer;

means for subtracting said second monetary value from said first monetary value to obtain a third monetary value;

means for recording said third monetary value on said card in the form of machine readable symbols and visible symbols and for recording machine-readable positional data on said card, said positional data including the location of the current recordation of said visible symbols;

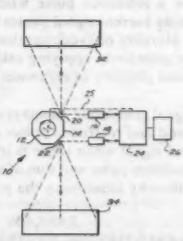


means for aligning said presented card in the apparatus such that said machine readable symbols and said visible symbols may be recorded on said card in predetermined positions, said aligning means being operative to position said card for successive uses thereof relative to said recording means so that said visible symbols are recorded in successive locations on said card each time the card is used, for ease of inspection by the customer, said aligning means being responsive to said positional data during the next successive use of said card to position said card such that said visible symbols are recorded in the next successive location therefor.

3,958,104
MULTIPLEXED OPTICAL SCANNER SYSTEM

Leonard Zuckerman, Whitestone, N.Y., assignor to Servo Corporation of America, Hicksville, N.Y.

Continuation of Ser. No. 448,654, March 6, 1974, abandoned. This application Aug. 18, 1975, Ser. No. 605,496
Int. Cl.² G06K *7/10;* **B01D** *23/24;* **G11B** *25/04*
U.S. Cl. 235—61.11 E **4 Claims**



1. A multiplexing optical scanner system including: a first electro-optical detection system including means for receiving an image of an object and producing an electrical signal output in response to the sensing of an image; a second electro-optical detection system including means for receiving an image of an object and producing an electrical signal in response to the sensing of an image; a single scanner including mirror means movable to alternately scan a first location and reflect an image of any object at said first location to said first detection system and to scan a second location and reflect an image of any object at said second location to said second detection system; means for moving said mirror means to scan said first and second locations; means for processing the elec-

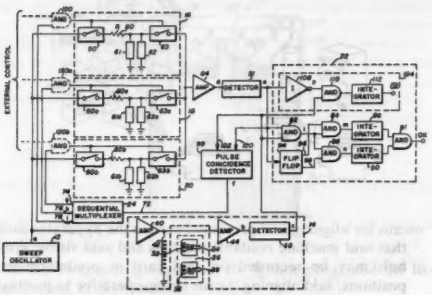
trical signal outputs of said detection systems; and switch means for alternately connecting the outputs of said first and second detection systems to said processing means.

3,958,105

ELECTRONIC RECOGNITION AND IDENTIFICATION SYSTEM FOR IDENTIFYING SEVERAL MASTER KEYS

David P. Sidlauskas, San Jose, Calif., assignor to Schlage Electronics, Inc., Sunnyvale, Calif.

Filed Apr. 10, 1975, Ser. No. 566,953
Int. Cl.² G06K 7/08
U.S. Cl. 235—61.11 H 8 Claims



1. An electronic recognition and identification system for identifying one of a plurality of electrically coded passive objects each having at least one tuned electrical circuit which is resonant at at least one of a plurality of predetermined frequencies, comprising:

signal source means for generating an alternating current signal, said alternating current signal having a frequency which varies with time over a range of frequencies including said plurality of predetermined frequencies;

a condition pulse generation network connected to said signal source means, said condition pulse generation network being responsive to said alternating current signal and operative to produce a condition pulse when one of the objects is proximate thereto and when the frequency of said alternating current signal passes through its predetermined frequency;

a plurality of reference pulse generating means each responsive to said alternating current signal and operative to produce a reference pulse when the frequency of said alternating current signal passes through a respective one of said plurality of predetermined frequencies;

means for selectively applying said alternating current signal to said plurality of reference pulse generating means; and

control signal generating means responsive to said condition pulses and said reference pulses and operative to produce a control signal when there is time coincidence between said condition pulse and one of said plurality of reference pulses thereby identifying the proximate object.

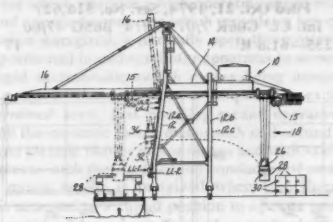
3,958,106

ARTICLE IDENTIFYING SYSTEM HAVING SCANNER FOR VERTICAL MOVEMENT IN SYNCHRONISM WITH THE ARTICLE

Norman C. Bedford, Hingham, and Stanley Ronchinsky, Newton, both of Mass., assignors to Beckwith Elevator Co., Inc., Boston, Mass.

Filed Dec. 24, 1974, Ser. No. 536,204
Int. Cl.² G06K 7/10
U.S. Cl. 235—61.11 E 13 Claims

1. An article identification system for use with a materials handling system in which articles are moved from one position to another by means which changes the elevation of the article while transferring it in a horizontal direction, said system comprising means for identifying the article when the article and identifying means are within a predetermined distance from each other, means for moving said identifying means along a predetermined vertical path between upper and lower



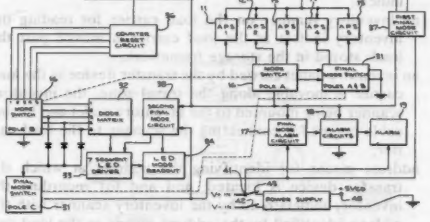
levels between which levels the article will be when it passes said path, and means controlling the vertical movement of the identifying means so that it moves in a vertical direction simultaneously with the vertical movement of the article.

3,958,107

FUEL MANAGEMENT COMPUTER

Andrew C. Edelson, 10832 Charnock Road, Los Angeles, Calif. 90034, and Soulie Levine, 131 N. Hamilton Drive, Suite 203, Beverly Hills, Calif. 90211

Filed Dec. 9, 1974, Ser. No. 530,818
Int. Cl.² G06F 15/50; B64D 37/14
U.S. Cl. 235—150.21 28 Claims



1. A fuel management computer for providing timing for usage of fuel tanks of an aircraft comprising:

signal means for generating signals at predetermined time segments,

a plurality of automatic program means, each operatively coupled to said signal means and each corresponding to a specific mode of usage of said fuel tanks,

mode control means coupled to said plurality of automatic program means for selecting one of said plurality of automatic program means in sequence for timing the usage of one of the fuel tanks of the aircraft, said mode control means being operatively coupled to said signal means to inhibit the provision of signals at the end of each mode of usage of said fuel tanks,

time segment display means operatively coupled to said signal means for providing a real time display of the time segment in which the computer is operating,

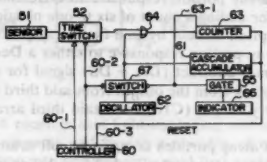
mode display means operatively coupled to said mode control means for providing a display of the mode in which the computer is operating, and

alarm means operatively coupled to said mode control means for providing an alarm signal at the end of each mode of usage to thereby enable the operator to time the usage of the fuel tanks.

3,958,108
BAROMETRIC ALTIMETER WITH DIGITAL LINEARIZATION

Naonobu Shimomura, No. 13-8, Sakuragaoka-cho, Shibuya, Tokyo, Japan

Filed Oct. 11, 1974, Ser. No. 514,229
Claims priority, application Japan, Oct. 13, 1973, 48-115140; Apr. 5, 1974, 49-38635; June 20, 1974, 49-70675
Int. Cl.² G06F *15/20*; G01L *7/00*
U.S. Cl. 235—150.25 5 Claims



1. A barometric altimeter for measuring altitude, comprising in combination:

pressure sensing means for producing an electrical signal having a value corresponding to the altitude being measured, wherein the value of said electrical signal is approximated by a power series of the value of the altitude being measured;

cascade accumulation means including memory means designated with addresses 0, 1, 2, . . . , N, where $N \geq 2$, and circuit means for algebraically adding the contents of said memory means having addresses 1, 2, . . . , N to the contents of said memory means having addresses 0, 1, 2, . . . , N−1 respectively, and thereby defining one cycle of cascade addition, wherein an interconnecting relationship is maintained between the inputs and outputs of said memory means with respect to said circuit means for algebraically adding during said one cycle, and said cascade accumulation means correlating a first variable and a second variable which have a digital mathematical relation, wherein said cascade accumulation means generates an output value equal to said first variable which is expressed as a power series of said second variable represented by the number of cycles of cascade additions;

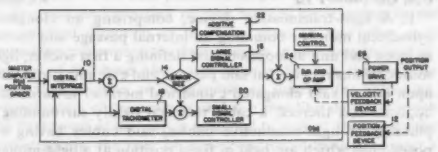
means for determining when said output value from said cascade accumulation means is equal to the value of said electrical signal produced by said pressure sensing means;

means for counting the number of cycles of cascade additions, representing said second variable, up to said time of equality, and indicating therefrom a digital value of said measured altitude.

3,958,109
UNIVERSAL MODULARIZED DIGITAL CONTROLLER

Donald W. Doherty, San Diego, and Elbert J. Wells, Jr., Del Mar, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 20, 1975, Ser. No. 542,485
Int. Cl.² G06F *15/46*
U.S. Cl. 235—151 7 Claims



1. A multiaxis power drive controller for a plant comprising:

interface means for receiving a digital plant position order from a master source, for receiving plant position feedback signals and for storing a plurality of predetermined constants;

arithmetic means connected to said interface means for performing addition, subtraction and multiplication operations and for outputting a digital velocity signal;

temporary storage means connected to said interface means and to said arithmetic means for storing the results of said operations of said arithmetic unit and for receiving digital information from said interface means;

mode select means connected to said temporary storage means for initiating the comparison of the error value $E(n)$, where $E(n)$ is the difference between said plant position order and said plant position feedback signal, with first and second predetermined conditions and for selecting first and second modes of operation in accordance with said comparison;

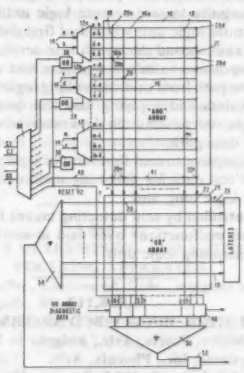
digital to analog conversion means connected to said arithmetic means for providing an analog velocity order to said power drive; and

timing and control means for outputting timing signals to said interface means, said arithmetic means, said temporary storage means, said mode select means and to said digital to analog conversion means.

3,958,110
LOGIC ARRAY WITH TESTING CIRCUITRY

Se J. Hong, and Daniel L. Ostapko, both of Poughkeepsie, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Dec. 18, 1974, Ser. No. 534,022
Int. Cl.² G06F *11/00*
U.S. Cl. 235—153 AC 7 Claims



1. In combination with a logic performing array comprising a grid of intersecting input and output lines with operative logic means located in at least some of the intersections and having a plurality of input decoders each interrogating a selected one of a plurality of input lines so that logic functions are performed on interrogating signals by the logic means and results presented on the output lines, apparatus for testing the array comprising;

a control decoder in which each different combination of input signals to the decoder causes the decoder to select a different one of the output lines of the control decoder; and,

AND circuit means in each input decoder for ANDing one output of the control decoder with a true or inverted signal for each of the inputs of the decoder to generate an interrogation signal for each of the input lines of the array

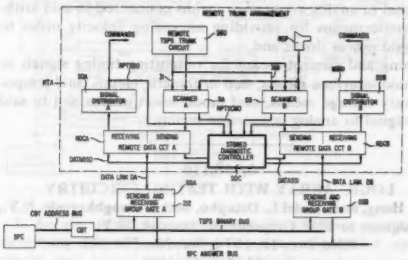
that is dependent on the presence of a select signal from the control decoder,

check line means intersecting the input lines for maintaining check information on the number of operative logic means located along each of the input lines of the array whereby the number of bits of each input line can be read out along with the check information to be used in a determination to see if the line is properly configured.

3,958,111
REMOTE DIAGNOSTIC APPARATUS

John Arthur Hackett, Howell Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 20, 1975, Ser. No. 560,316
Int. Cl.² G06F *11/00*
U.S. Cl. 235—153 AK **19 Claims**



1. In a system wherein a first and second remote logic unit respectively communicate with a local controlling logic unit over first and second data paths, a diagnostic controller in physical proximity to said remote logic units for diagnosing said first remote logic unit when said first data path is out-of-service and said second data path is in-service, comprising

means responsive to informtion received over said in-service data path from said controlling logic unit for generating test data and applying said test data to said remote first logic unit to simulate data received over said out-of-service data path,

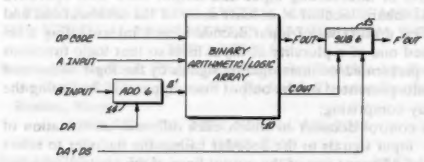
means responsive to said first remote logic unit's operations on said test data for detecting malfunctions in said first remote logic unit, and

means controlled by said detecting means for reporting any detected malfunctions over said in-service data path to said controlling logic unit.

3,958,112
CURRENT MODE BINARY/BCD ARITHMETIC ARRAY

Homer W. Miller, Peoria, Ariz., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed May 9, 1975, Ser. No. 576,075
Int. Cl.² G06F *7/50*
U.S. Cl. 235—174 **5 Claims**



1. A current mode arithmetic logic array for operating on pure binary and on binary coded decimal data comprising:

a first array portion for receiving a carry input, a binary operation code, and first and second binary signal inputs and producing half-sum of said inputs and carry generate output signals in response to said binary operation code,

a second array portion receiving said carry input, said half-sums and said carry generate signals and producing carry signals for each binary level of said first and second signals other than the least significant binary level,

a third array portion responsive to said half-sum signals from said first portion, said carry signals from said second portion, and said operation code and producing a binary output resultant of the operation defined by said operation code on said first and second binary signals,

a fourth array portion responsive to a Decimal Add (DA) signal for adding a count of six to one of said inputs prior to reception thereof by said first array portion, and

a fifth array portion responsive to either a Decimal Add or a Decimal Subtract (DA + DS) signal for subtracting a count of six from the output from said third array portion if a carry output (C16) from said third array is not present,

all of said array portions comprising soft saturating current mode logic series gates including a lower level gate and an upper level gate having an output voltage range limited to approximately 0.5 volt.

3,958,113
LIGHTING EFFECTS DEVICE

Carol I. Termohlen, 217 16th St., Apt. No. 1, Huntington Beach, Calif. 92648

Continuation-in-part of Ser. No. 354,825, April 26, 1973, abandoned. This application Aug. 12, 1974, Ser. No. 496,735
Int. Cl.² A47G *33/16;* **F21P** *1/02*
U.S. Cl. 240—1 EL **10 Claims**

1. A lighting effects device comprising:

a piece of solid transparent plastic material, a plurality of differently colored light emitting means positioned within said plastic material, said plastic material having a frosted rear surface for diffusing light from the light emitting means and glowing as a solid field of luminous light and a clear front surface providing an unobstructed view of the glowing frosted surface; and

means for variously energizing the light emitting means in one color and in a combination of colors for causing the frosted surface to glow and provide a field of light which changes hue with variations in the energization of the light emitting means.

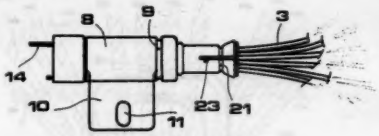
3,958,114
LIGHT DIFFUSING DEVICE WITH LIGHT-GUIDE CABLES AND CABLE TERMINAL

Giuseppe Codrino, 2, Via Stazione, Quattordio, Alessandria, Italy

Filed Oct. 15, 1974, Ser. No. 515,008
Claims priority, application Italy, Oct. 15, 1973, 30131/73
Int. Cl.² F21K *7/00*
U.S. Cl. 240—1 LP **9 Claims**

1. A light-transmission device, comprising an elongated cylindrical member bounding an internal passage and having an open end and an opposite end defining a first socket; light source means received in said passage and extending from said open end of said elongated cylindrical member towards said opposite end thereof; a cable terminal tightly surrounding a plurality of light-conductive cables, said cables having exposed ends which are held in fixed position at a light-impinging end of said terminal; and a connecting member for inter-

connecting said terminal and said elongated cylindrical member, said connecting member having an end defining a second



socket which receives said light-impinging end of said terminal, and an opposite end having a plurality of engaging portions extending into and engaging said first socket.

3,958,115

MULTIPLE FLASHLAMP UNIT WITH INDEXING MEANS

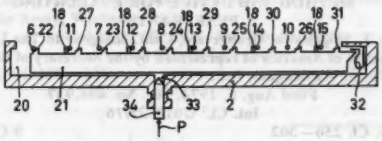
Ernst Machiel Schmidt, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 6, 1974, Ser. No. 503,804

Claims priority, application Netherlands, Sept. 28, 1973, 7313363

Int. Cl.² G03B *15/02*

U.S. Cl. 240—1.3 **12 Claims**



1. A flashlamp unit comprising a number of combustion flashlamps arranged in at least one row, mounted on an elongate base plate and extending in parallel with their longitudinal axes, which lamps can each be fired by a stroke against a lamp part, said flashlamp unit comprising a number of striker springs which are locked in an energized condition, which number corresponds to the number of flashlamps and which springs are designed to give a stroke against the lamp part of one of the flashlamps after unlocking, said unit furthermore comprising at least one elongate body which extends in the longitudinal direction of the base plate, is movable in said direction said body having a number of projections, each projection cooperating with one striker spring to unlock the cooperating striker spring, said body, being movable responsive to an associated member to be introduced into the unit from without, characterized in that the direction of the unlocking movement of the body extends mainly perpendicular to the plane of the base plate, a transport spring being present in the unit and exerting on the body a force acting in the longitudinal direction of the base plate so that after each unlocking movement the body moves in the longitudinal direction of the base plate over such a distance that another projection assumes an initial position suitable for unlocking, wherein each of the projections has a step-like shape, in which the first tread of the step is designed to unlock the associated striker spring, the riser of the second tread bearing against a part of the striker spring in a position of the projection suitable for unlocking said striker spring.

3,958,116

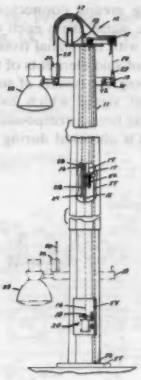
LUMINAIRE RING LOWERING MECHANISM

Clifton E. Jones, 1710 Welch Blvd., Flint, Mich. 48504

Filed Sept. 27, 1973, Ser. No. 401,290

Int. Cl.² F21V *21/16*

U.S. Cl. 240—67 **9 Claims**



1. In an apparatus for raising and lowering a luminaire ring on a pole shaft, the combination including:

a continuous loop drive chain positioned within a pole shaft, said continuous loop drive chain extending approximately the entire length of said pole shaft;

a transition plate fixedly attached and enclosing said continuous loop chain so as to selectively move upwardly and downwardly in response to corresponding movement of said drive chain;

suspension cable means connected at one end to said transition plate, said suspension cable means extending upwardly within said pole shaft to the exterior thereof;

a luminaire ring attached to the opposite ends of said suspension cable means on the exterior of said pole shaft, said luminaire ring being selectively raised and lowered along said pole shaft in response to corresponding movement of said suspension cable means.

3,958,117

DISTANCE DETERMINING AND AUTOMATIC FOCUSING APPARATUS

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 15, 1975, Ser. No. 596,059

Int. Cl.² G01J *1/20*

U.S. Cl. 250—201 **18 Claims**

13. Apparatus for automatically focusing the image of an object, comprising

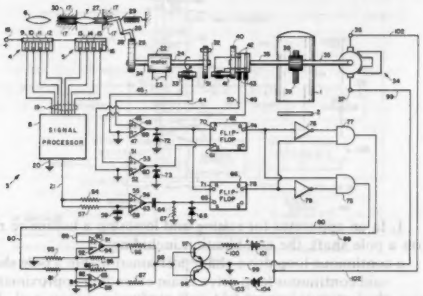
a plurality of radiation responsive elements divided into two similar detector arrays, each of said elements being arranged to provide an electrical signal representative of the intensity of radiation impinging thereon,

first auxiliary optical means defining a first optical path for radiation from the object and for forming a first detection image thereof on solely one of said arrays,

second auxiliary optical means defining a second optical path for radiation from the object and for forming a second detection image thereof on solely the other of said arrays, the positions and radiation distributions of said detection images on the corresponding arrays changing with changes in the relative positions of said auxiliary means and said arrays, and with changes in the object distance, there being for each such distance a one of the last-mentioned positions at which there is best correspondence of said distributions on said arrays,

scanning means for relatively moving at least a portion of at least one of said auxiliary means and the corresponding one of said arrays progressively through a predetermined range of relative positions during a time period, said range including said one position at which there is said best correspondence of said distribution on said arrays for the existing object distance,

signal processing means connected to said elements for comparing the signal from each of said elements of one of said arrays with the signal from the positionally corresponding one of said elements of the other of said arrays, and for summing the results of such comparisons to provide an output signal which exhibits a predetermined effect when said best correspondence of said distributions on said arrays is obtained during said period,



primary optical means arranged for producing a primary image of the object on an image plane and capable of adjustment into any of a plurality of positions, said primary image being in best focus on said plane when the position of said primary optical means corresponds to the one of said relative positions in said range at which said effect is produced during said period, and

responsive means including first means coupled to said signal processing means and said scanning means and responsive to said effect and to said relative movement of said auxiliary means and said arrays to effectively ascertain at which of said relative positions in said range said effect is produced during said period, and including second means coupled to said primary optical means to effectively ascertain the instantaneous position thereof, to compare said two ascertained positions, and to adjust said primary optical means as necessary to make said ascertained positions correspond.

3,958,118

INTRUSION DETECTION DEVICES EMPLOYING MULTIPLE SCAN ZONES

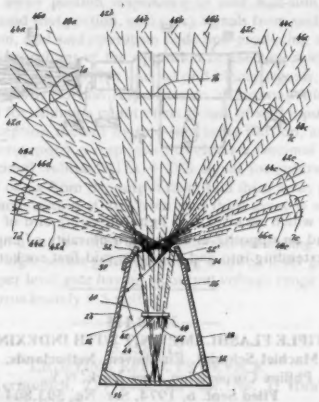
Frank Schwarz, Stamford, Conn., assignor to Security Organization Supreme-SOS-Inc., Stamford, Conn.

Filed Feb. 3, 1975, Ser. No. 546,629
Int. Cl.² G01D 21/04
U.S. Cl. 250—221 **31 Claims**

1. For use in an intrusion monitoring device of the type which has a group of radiation detectors, each of which monitors a segment of a primary scan zone, and which produces an alarm signal when energy being emitted from bodies as they move among said segments is received by more than one of said detectors within a pre-determined time span, wherein no two adjacent segments are associated with the same detector

a scan zone multiplier device for increasing the scan zone capability of said monitoring device to cover at least one secondary zone in addition to said primary scan zone comprising

means for directing radiation energy being emitted from bodies in each of said secondary scan zones to said detectors whereby each of said zones will have at least one segment thereof monitored by a detector, and wherein no



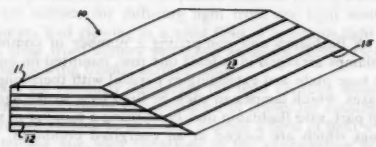
two adjacent segments within any of said secondary zones or between any of said secondary zones or between any of said secondary zones and said primary zone are monitored by the same detector.

3,958,119

METHOD AND DEVICE FOR EVALUATING PENETRANTS

Toy T. Shigekawa, Orangevale, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 5, 1974, Ser. No. 494,937
Int. Cl.² G01N 21/16
U.S. Cl. 250—302 **9 Claims**



1. A method for evaluating the efficiency of liquid penetrants in detecting flaws which comprises applying a penetrant to be evaluated to a bevelled surface of a laminate of adhesively bonded metal sheets, the surface having shallow, parallel grooves formed therein between the metal sheets; removing excess penetrant from the surface while leaving penetrant in the grooves; applying a developer to the surface; and observing the appearance of the surface.

3,958,120

RADIOGRAPHIC INSPECTION OF STEAM GENERATOR TUBES

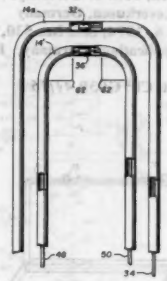
Charles Theodore Ward, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 12, 1973, Ser. No. 415,042
Int. Cl.² G03B 41/16
U.S. Cl. 250—321 **8 Claims**

1. In a steam generator having a vessel housing a plurality of open ended tubes arranged laterally adjacent to one another and supported near said ends by a substantially continu-

ous tube sheet extending across said vessel, apparatus for providing a radiographic image of a portion of a said tube comprising:

a. a radiation responsive image recording means insertable in said tube to be inspected to a first location therealong; and

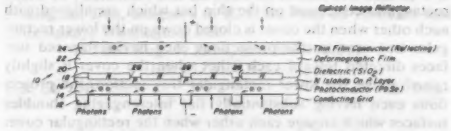


b. a source of radiation insertable in another said tube to a position therealong laterally adjacent said first location for emitting radiation between said source and said radiation responsive image recording means.

3,958,121
INFRARED IMAGE STORAGE PLATE

Charles M. Redman, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 10, 1975, Ser. No. 612,065
Int. Cl.² H01J *31/49*
U.S. Cl. 250—330 **10 Claims**



1. In a system for storing infrared radiation images, a device having a multilayered structure including an input face for receiving incident radiation images and an output face from which the stored images may be read out, said multilayered structure comprising:

a first electrically conductive electrode defining said input face;

means formed on said first electrode for forming electron-hole pairs in response to the receipt of said incident radiation images;

a semiconductor element including a continuous P-type material facing said first electrode and a plurality of N-type islands thereon facing away from said first electrode, the interface between said P and N-type materials storing charge in response to the formation of electron-hole pairs;

a dielectric coating covering said N-type islands;

a deformographic film overlying said dielectric coating, said film deforming in response to electrical charge levels stored at the interfaces of said P and N-type materials;

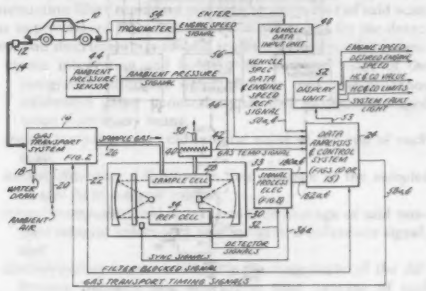
a second electrically conductive electrode overlying said deformographic film and defining the output face of said multilayered structure; and

means for applying an electrical potential across said first and second electrodes.

3,958,122
EXHAUST GAS ANALYZER HAVING PRESSURE AND TEMPERATURE COMPENSATION

Terence W. Jowett, Avon, Conn.; Anthony D. M. Knights, Longmeadow, Mass., and Thomas A. Cross, Winsted, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1974, Ser. No. 534,493
Int. Cl.² G01N *21/34*
U.S. Cl. 250—346 **11 Claims**



1. A gas analysis system for measuring the amount of a selected contaminant in a sample gas comprising

means for generating a beam of infrared radiation,

a sample cell adapted to contain a gas,

means for passing a sample gas through said sample cell,

a reference cell containing a reference gas,

means for passing said beam alternately through said sample cell and said reference cell,

detector means responsive to said beam and producing respectively first and second electrical signals respectively indicative of the absorption of said beam by the selected contaminant within said cells,

means responsive to said first and second signals for computing an output signal indicative of the amount of said selected gas contaminant in said sample gas,

means for measuring the temperature of said sample gas and producing a gas temperature signal indicative thereof,

means for producing a pressure signal indicative of the ambient pressure,

and compensation means responsive to said gas temperature signal and said pressure signal for correcting said output signal.

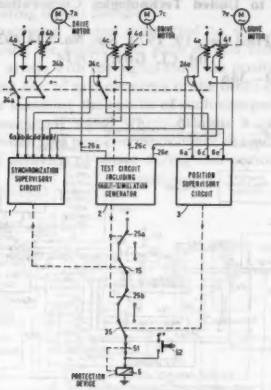
3,958,123
APPARATUS FOR AUTOMATICALLY TESTING X-RAY SUPERVISORY APPARATUS

Wolfgang Hecker, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 2, 1974, Ser. No. 457,239
Claims priority, application Germany, Apr. 9, 1973, 2317744
Int. Cl.² H05G *1/30*
U.S. Cl. 250—413 **1 Claim**

1. In X-ray examining apparatus having a supervisory circuit that monitors the output voltage from a transducer, said supervisory circuit having an output that actuates a switch indicating a fault when said output voltage from said transducer lies within a predetermined range that corresponds to a failure, the improvement comprising a test circuit for periodically testing whether said supervisory circuit is properly functioning and for actuating said switch indicating a fault when said supervisory circuit is not properly functioning, said test circuit comprising means for generating a voltage which lies within said predetermined range to simulate the corresponding failure, switching means for periodically applying said generated voltage to said supervisory circuit in place of the output volt-

age from said transducer and means synchronized with said switching means for logically complementing said output of said supervisory circuit during the periodic application of said generated voltage to said supervisory circuit, whereby said



switch indicating a fault is actuated during the periodic application of said generated voltage only if said output of said supervisory circuit then does not indicate a failure and during any other time only if said output does indicate a failure.

3,958,124

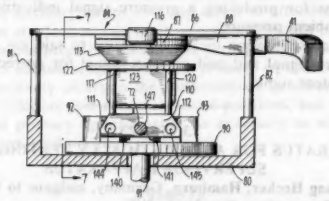
METHOD AND APPARATUS FOR SEM SPECIMEN COATING AND TRANSFER

George R. Koch, Palo Alto, and Carl T. Petersen, Livermore, both of Calif., assignors to Etec Corporation, Hayward, Calif.

Division of Ser. No. 398,101, Sept. 17, 1973, Pat. No. 3,858,049. This application Sept. 5, 1974, Ser. No. 503,226

Int. Cl.² G21K *5/06*

U.S. Cl. 250—442 **6 Claims**



1. A moveable specimen shuttle for facilitating transfer of a specimen carried by a detachable specimen cap to the interior of an SEM chamber, said chamber including a platform having a pair of mounting surfaces, said shuttle comprising:

a base member having a spaced pair of angled shoulder surfaces adapted to be engaged with said pair of mounting surfaces of said platform;

an upper member having means for securing a specimen cap thereto;

means for supporting said upper member above said base member; and

adjustable support means mounted in said base member for providing low friction sliding support for said shuttle when in a first operative position in which said shuttle can be transferred to and from said chamber and for elevating said base member to a position of engagement with said mounting surfaces when in a second operative position in which said shuttle is secured within said chamber with said angled shoulder surfaces in contact with said mounting surfaces.

3,958,125

X-RAY CASETTE WITH A SNAP-ACTION CLOSURE SYSTEM

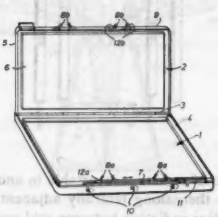
Wilhelm Zechmair, Langenmoosen, and Hans Josef Müller-Rech, Schrobenhausen, both of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Dec. 6, 1974, Ser. No. 530,170

Claims priority, application Germany, Dec. 12, 1973, 2361768

Int. Cl.² G03B *41/16*

U.S. Cl. 250—480 **2 Claims**



1. An X-ray cassette comprising a substantially rigid lower rectangular tray section, having a peripheral rim, a resilient rectangular cover having a peripheral rim and a slight convex curvature in its free state relative to the rim of the lower rectangular tray section, a snap-action closure system for closing the cassette and flattening the convex curvature of the cover against the peripheral rim of the lower tray section, hinge means connecting rear portions of the resilient rectangular cover and lower rectangular tray section, a thin bar, slide means mounting the thin bar within the peripheral rim of the lower rectangular tray section remote from the hinge, projections on the outside of the front of the rim of the resilient rectangular cover and on the thin bar which are aligned with each other when the cover is closed down on the lower rectangular tray section, the projections each having tapered surfaces directed toward each other when the cover is slightly raised above the lower rectangular tray section, the projections each having substantially flat interengaging shoulder surfaces which engage each other when the rectangular cover is pressed downwardly into full engagement with the lower rectangular tray section whereby the cover is resiliently locked to the lower rectangular tray section against the resiliency of the convex curvature of the cover, a lever movably mounted on the lower rectangular tray section and connected to the thin bar whereby movement of the lever shifts the thin bar longitudinally to missalign its projections with those on the front rim of the cover whereby the flat shoulder surfaces of the projections on the thin bar are shifted out of line with those on the front rim of the cover whereby the cover is released and allowed to be opened by the resilient convex curvature away from the lower rectangular tray section.

3,958,126

LOGIC CIRCUITRY

Jack A. Bryant, Boston, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.

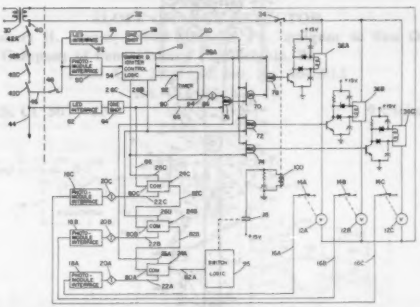
Filed Nov. 25, 1974, Ser. No. 526,504

Int. Cl.² G02B *27/00*

U.S. Cl. 250—554 **12 Claims**

1. In a burner control system having a field device, said field device having circuitry to provide a field signal indicating the state of the field device, burner control logic for providing a control signal to change the state of said field device, a comparator for comparing said field signal and said control signal,

said comparator comprising translation circuitry having a signal input terminal, a signal output terminal, and power supply conductors, and being arranged to produce a pulse train signal at said output terminal in response to a pulse train signal applied to said signal input terminal, and power supply circuitry connected to said power supply conductors, said power supply circuitry having first and second logic inputs and being arranged to apply power to said power supply conductors in response to a proper comparison between said field



signal applied to said first logic input and said control signal applied to said second logic input and to remove power from said power supply conductors in response to a different set of field and control signals applied to said logic inputs that do not properly compare, circuitry to apply said field signal to said first logic input, circuitry to apply said control signal to said second logic input, and circuitry responsive to the pulse train signal at said output terminal for placing said field device in safe condition when said comparator does not produce said pulse train signal at said output terminal.

3,958,127

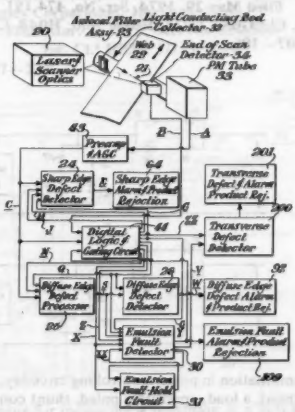
OPTICAL-ELECTRICAL WEB INSPECTION SYSTEM

Mark E. Faulhaber, and Edmund H. Smith, Jr., both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 9, 1974, Ser. No. 496,319

Int. Cl.² G01N 21/32

U.S. Cl. 250—563 **2 Claims**


Laser/Scanner Optics
Web 22
End of Scan Detector 34
PM Tube 33
Preamp & AGC
Sharp Edge Defect Detector
Sharp Edge Manual Product Rejection
Transverse Defect & Alarm Product Rej.
Digital Logic & Gating Circuit
Transverse Defect Detector
Diffuse Edge Defect Processor
Diffuse Edge Defect Detector
Diffuse Edge Defect Alarm & Product Rej.
Emulsion Fault Detector
Emulsion Fault Alarm & Product Rejection
Emulsion Fault Hold Circuit

1. In a flying spot inspection system for web materials having a radiation source, means traversing a beam of radiation from said source in a scan across said web, electronic means responsive to said beam of radiation in either the reflection mode or the transmission mode with respect to said web detecting the existence of transverse defects or defects oriented in the scan direction, discriminating means responsive to said electronic means detecting said defects identifying web materials containing said defects and passing the remainder of said web materials as acceptable product, and automatic calibration means providing at the outset of each said scan said electronic means with an instantaneous basic reference voltage signal retained during the balance of each said scan determined by operation of said system with a preselected radiation attenuation filter replacing said web at the outset of said scan, the improvement wherein said electronic means for the detection and discrimination of said transverse defects comprises:

means integrating and holding the terminal value of the integrated difference signal between each instantaneous calibrated gated pedestal signal and its time-averaged value over many scans,

means sampling said held integral value at the end of each scan,

means obtaining a short-term time average of the samples of said held integral values,

means comparing said short-term time average of said sampled integral values with said integrated difference signal, and

discriminating means evaluating the magnitude of the difference between said short-term time average of said sampled integral values and said integrated difference signals with respect to preselected (+) and (−) polarity thresholds and means to initiate an alarm for each signal exceeding said preselected thresholds at the sampling instant.

3,958,128

SYSTEM FOR DETERMINING A TRANSVERSAL POSITION OF ANY DEFECT IN A TRAVELING SHEET MATERIAL

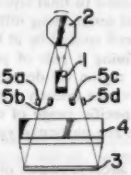
Shoji Akutsu; Yasumasa Watanabe; Yasuhiko Mashino, all of Chiba; Tomohiro Chaki, and Masakazu Fujita, both of Tokyo, all of Japan, assignors to Kawasaki Steel Corporation and Toei Denshi Kogyo Kabushiki Kaisha, both of, Japan

Filed Sept. 24, 1974, Ser. No. 508,802

Claims priority, application Japan, Sept. 28, 1973, 48-108543; Sept. 28, 1973, 48-108544

Int. Cl.² G01N 21/32

U.S. Cl. 250—563 **3 Claims**



1. A system for determining the transversal position of any defect in a traveling sheet material, comprising means for projecting a scanning light beam onto one side of the traveling sheet material to be inspected, means for detecting a defect in the sheet material which is arranged to receive the reflected scanning light beam from the material and to generate a defect signal when there is a defect in the sheet material, and means for detecting a scanning zone in the sheet material, said means for detecting a scanning zone being arranged between the light source and the said sheet material to receive partly the scanning light beam before said light beam impinges on said one surface of sheet material and to generate an output signal for the determination of the scanning zone, the transversal posi-

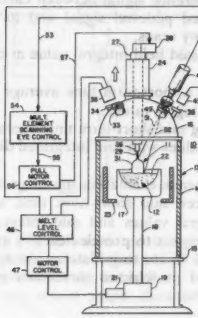
tion of the defect in the material being determined by the coincidence between a defect signal from said defect detector means and the output signal from the said scanning detecting means.

3,958,129

AUTOMATIC CRYSTAL DIAMETER CONTROL FOR GROWTH OF SEMICONDUCTOR CRYSTALS

Donald R. Clement; Carl A. Helber, both of Scottsdale, and Lawrence D. Mason, Phoenix, all of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Aug. 5, 1974, Ser. No. 494,438
Int. Cl.² G01N 21/26
U.S. Cl. 250—577 5 Claims



1. In a system for automatically growing a crystal of controlled diameter from a seed, through neckin, shoulder, body and final taper from a melt of material including a container for said melt, motor means for pulling a crystal from said melt, means for controlling said motor means, and means responsive to radiation emanating from the liquid-solid interface of said crystal including the halo as said crystal as being pulled for controlling said motor control means comprising,

photo-sensitive means positioned to receive radiation from said liquid-solid interface throughout the total region from seed to final taper;

said photo-sensitive means comprising a series of successively disposed photocells each one of which is arranged to receive radiant energy from a specific area of said liquid-solid interface including said halo as said crystal is being pulled from seed to final taper,

each photocell of said series being differentially connected to a second photocell spaced by at least one intervening photocell and defining a pair of photocells defining a linear error signal region for developing an error signal whose magnitude varies linearly with changes in crystal diameter over a specific range of crystal diameter and having a null value at a particular value of crystal diameter,

the signal from each successive pair of said photocells having a null value at a particular value of crystal diameter greater than the preceding crystal diameter by the same predetermined amount,

the linear error signal region of each pair of said photocells extending to the linear error signal region of the next succeeding apir of photocells,

programmed means for automatically selecting in sequence the successive pairs of said photocells throughout the cycle of crystal growth from seed to final taper;

means for developing a crystal diameter related offset signal, and

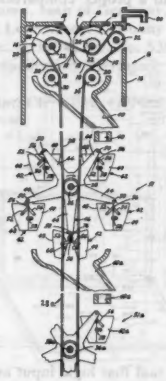
means for combining said offset signal and error signal and supplying same to said motor control means for controlling said motor to pull said crystal to a predetermined diameter.

3,958,130

HYDROELECTRIC GENERATING SYSTEM

Bernard Van Mechelen, 704 Bertsch Ave., Crescent City, Calif. 95531

Filed June 6, 1975, Ser. No. 584,460
Int. Cl.² F03B 7/00
U.S. Cl. 290—54 6 Claims



1. A hydroelectric generating mechanism which comprises

a. an electrical generator unit that includes a generator shaft having affixed thereto a series of evenly spaced, water bucket carrying arms, each pivotally supporting a bucket at the outer end thereof;

b. a water metering device operated by said shaft and constructed and arranged alternately to deliver water to a bucket in an elevated, water receiving position a little past top dead center for driving the generator shaft and to cut off the delivery of water when a bucket has been substantially filled; and

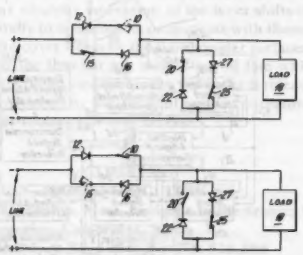
c. means for causing each bucket to discharge its load of water at substantially the lower limit of its travel so that it will travel upward empty.

3,958,131

SOLID STATE POWER CONTROL APPARATUS

Alexander Mozdzer, Valley Stream, N.Y., assignor to Staley Elevator Company, Inc., Long Island City, N.Y.

Filed May 29, 1974, Ser. No. 474,191
Int. Cl.² G05B 11/28; H02K 3/00; H04B 13/00
U.S. Cl. 307—106 9 Claims



1. In combination in power controlling circuitry, a source of A.C. potential, a load, oppositely poled, shunt connected first and second directional controlled switches connected in parallel with said load, oppositely poled shunt connected third and fourth directional controlled switches serially connecting

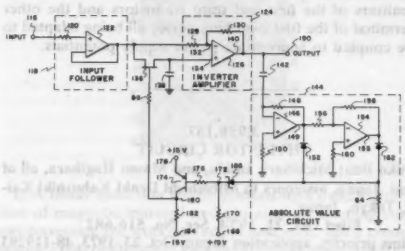
said load with said source of A.C. potential, and control circuit means, said control circuit means comprising pulsing means for alternately enabling each of said third and fourth directional controlled switches in a chopping mode of operation to control the power supplied to said load, said pulsing means comprising means for supplying a repetitive series of switchenabling pulses to each of said third and fourth directional controlled switches during each associated half-cycle of said A.C. potential.

3,958,132

SLOPE CHANGE DETECTOR

Robert H. Livesay, West Chester, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Apr. 25, 1974, Ser. No. 464,012
Int. Cl.² H03K *5/18*
U.S. Cl. 307—231 **9 Claims**



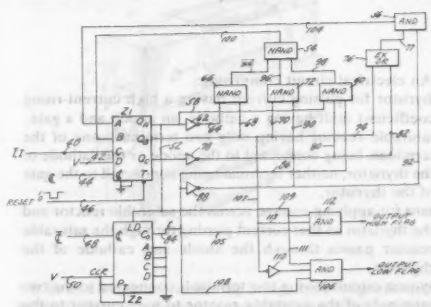
1. Apparatus for detecting a change in slope in an electrical signal, comprising: a differential amplifier having a first input terminal connected to the signal source; means connected to a second input of a differential amplifier for accumulating the signal; means connected between the signal source and the accumulating means for controlling signal access to the accumulating means; means connected to the output terminal of the differential amplifier for deriving the absolute value of the output signal; and means connected between the controlling means and the absolute value deriving means for operating the controlling means when the absolute value signal reaches a predetermined level.

3,958,133

DIGITAL NOISE DISCRIMINATOR

Rocco V. Albano, Meriden; Robert J. Fraleigh, Vernon, and Jack E. Steffens, Ellington, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 3, 1975, Ser. No. 554,805
Int. Cl.² H03K *5/153, 5/18*
U.S. Cl. 307—234 **4 Claims**



1. Apparatus for indicating a transition in a two level logic signal from one of said two levels to the other of said levels which remains at the other level for a selected time period, comprising

a flip flop connected to receive said logic signal as an input thereto,

means responsive to a transition in the signal level of said logic signal from a first level to a second level for producing a change in the output state of said flip flop,

a timing means having a preselected timing period,

means responsive to a change in the output state of said flip flop for actuating said timing means,

means for resetting said timing means upon a transition in said logic signal from said second level to said first level during the time that said timing means is actuated,

means responsive to the timing out of said timing means for producing a first output signal,

means including said flip flop-responsive to a transition in said logic signal from said second level to saif first level for actuating said timing means,

means for resetting said timing means upon a transition in said logic signal from said first level to said second level during the time that said timing means is actuated,

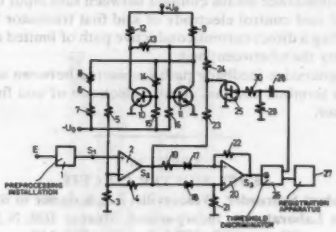
and means responsive to the timing out of said timing means for producing a second output signal.

3,958,134

INSTALLATION FOR THE DETECTION AND PROCESSING OF ELECTRICAL SIGNALS

Michael Maas, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Dec. 16, 1974, Ser. No. 533,444
Claims priority, application Germany, Dec. 19, 1973, 2363218
Int. Cl.² H03K *5/20*
U.S. Cl. 307—235 K **6 Claims**

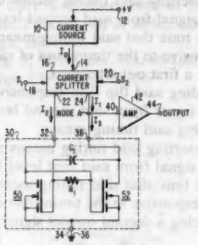


1. In an installation for the detection and, respectively, processing of electrical signals, in particular physiological measuring signals, such as EKG, including said signal signal channel, a signal rectifier for said signals in said channel; and a threshold discriminator at the output of said rectifier having a threshold set to a predetermined amplitude value of the rectified signals, the improvement comprising: a signal polarity detector actuated by said threshold discriminator for detecting the polarity of the threshold-exceeding signal amplitude preceding the rectifier at the instance of exceeding the threshold value of said threshold discriminator; and a direct potential generator actuated by said signal polarity detector for superimposing on the signals preceding said rectifier a direct potential of a polarity in conformance with the polarity of the detected signal at least until the incidence of a successive exceeding of said threshold value, whereby said direct potential has a value ranging between zero and the threshold value of said threshold discriminator.

3,958,135
CURRENT MIRROR AMPLIFIERS

Bruce David Rosenthal, Highland Park, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 7, 1975, Ser. No. 602,747
Int. Cl.² H03K *5/20, 1/12*
U.S. Cl. 307—235 F **13 Claims**

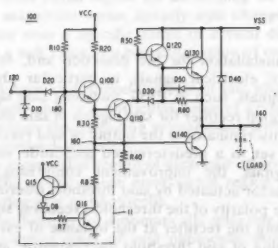


1. A current mirror amplifier comprising, in combination:
an input terminal, a common terminal and an output terminal;
first and second transistors, each having a conduction path with first and second electrodes at the ends thereof and a control electrode, said second electrodes being connected to said common terminal, said input terminal being coupled to said first electrode of said first transistor, and said output terminal being coupled to said first electrode of said second transistor;
first circuit means coupled between said input terminal and said control electrode of said second transistor for providing a direct current conductive path therebetween;
first impedance means coupled between said input terminal and said control electrode of said first transistor for providing a direct current conductive path of limited conductivity therebetween; and
a regenerative feedback path connected between said output terminal and said control electrode of said first transistor.

3,958,136
LEVEL SHIFTER CIRCUIT

Paul Robert Schroeder, Wescosville, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 9, 1974, Ser. No. 496,148
Int. Cl.² H03K *17/00*
U.S. Cl. 307—254 **5 Claims**

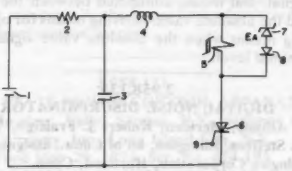


1. A level shifter circuit comprising:
a first switching device comprising a control terminal and two output terminals;
a first junction saturation transistor comprising a base, an emitter and a collector, the collector of the first transistor being coupled to one of the output terminals of the first switching device;
a second saturation junction transistor comprising a base, an emitter and a collector, the emitter and collector of the second transistor being coupled to the base of the first transistor and the control terminal of the first switching device;
input circuit means having input and output terminals and being responsive to signals applied to the input terminal, the output terminal of the input circuit means being coupled to the base of the second transistor;
coupling circuit means characterized by at least one output terminal and only one input terminal;
a third saturation junction transistor comprising a base, an emitter and a collector, the collector of the third transistor being coupled to the base of the first transistor and the base of the third transistor being coupled to the input circuit means through the coupling circuit means; the emitters of the first and third transistors and the other terminal of the first switching device all being adapted to be coupled to appropriate power supply potentials.

3,958,137
THYRISTOR CIRCUIT

Takahiko Iida; Michiharu Ishido, and Masao Hagihara, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1974, Ser. No. 516,682
Claims priority, application Japan, Oct. 23, 1973, 48-119293
119293
Int. Cl.² H03K *17/14*
U.S. Cl. 307—282 **8 Claims**



1. An electrical circuit comprising:
a thyristor for passing current having a high current-rising coefficient di/dt having a cathode, an anode and a gate,
a saturable reactor having only two terminals, one of the terminals being connected to the anode or the cathode of the thyristor, neither terminal being connected to the gate of the thyristor,
means for applying voltage across the saturable reactor and the thyristor so that current passing through the saturable reactor passes through the anode and cathode of the thyristor,
a by-pass circuit having two terminals connected to the two terminals of the saturable reactor to pass current to the cathode and anode of the thyristor to enlarge the initial turn-on region of the thyristor during the unsaturated period of the saturable reactor to prevent a high temperature at the hot spot of the thyristor.

3,958,138
LINEAR INDUCTION MOTORS

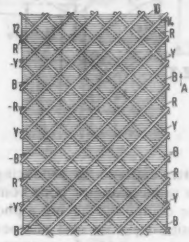
John Frederick Eastham; Eric Roberts Laithwaite, both of Long Ditton; Thomas George Fellows, Barnet, and David John English Bromilow, Bottisham, all of England, assignors to Tracked Hovercraft Limited, London, England

Continuation of Ser. No. 287,284, Sept. 8, 1972, abandoned. This application Oct. 24, 1974, Ser. No. 517,641

Claims priority, application United Kingdom, Sept. 10, 1971, 42378/71

Int. Cl.² H02K *41/02*

U.S. Cl. 310—13 **15 Claims**



1. A linear induction motor comprising a primary having a core of magnetic material and plural phase winding conductors traversing the working face of said core, and a secondary having a reaction plate of electrically conductive material and a core of magnetic material substantially coextensive in width with said primary core, characterized in that the winding conductors of said primary on at least part of the working face of said primary core are arranged in two superimposed groups inclined in opposite directions to the longitudinal axis of the motor, said two groups of winding conductors being disposed in close proximity to the magnetic core of said primary so as to be magnetically coupled thereto.

3,958,139
ELECTRIC MOTOR WITH BRIDGE-TYPE MAGNETIC CIRCUITS

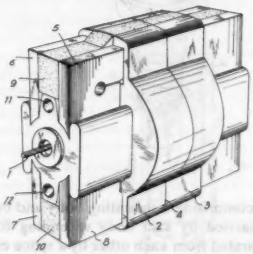
Claude Oudet, Besancon, France, assignor to Societe de Recherches en Matiere de Micromoteurs Electriques, Besancon, France

Filed Dec. 4, 1974, Ser. No. 529,576

Claims priority, application France, Dec. 7, 1973, 73.43645

Int. Cl.² H02K *37/00*

U.S. Cl. 310—49 R **10 Claims**



1. In an electric motor having bridge-type magnetic circuits and including an armature formed of magnetically permeable material and disposed for rotation about an axis, the armature including first and second sets of rotor poles, the first and second sets being axially spaced apart; and a permanent magnet stator structure; the improvement comprising:

first and second parallel magnetic members symmetrically disposed with respect to a first plane of symmetry and exhibiting north and south magnetic polarities, respectively, said first plane of symmetry including the rotor axis, said first and second magnetic members terminating in salient stator poles magnetically coupled with said first and second sets of rotor poles, respectively;

third and fourth parallel magnetic members symmetrically disposed with respect to said first plane of symmetry and exhibiting north and south magnetic polarities, respectively, said first and second, and third and fourth members being symmetrically disposed with respect to a second plane of symmetry, said second plane of symmetry including said rotor axis, said first, second, third and fourth members exhibiting alternating polarities; said third and fourth magnetic members terminating in salient stator poles magnetically coupled with said first and second sets of rotor poles, respectively;

the salient stator poles defined by said first, second, third and fourth members having pole surfaces that are spaced apart by 90° and angularly displaced from said first and second planes of symmetry by 45°; and

a coil for generating a flux in response to the energization thereof, said coil being magnetically coupled to all of said salient stator poles.

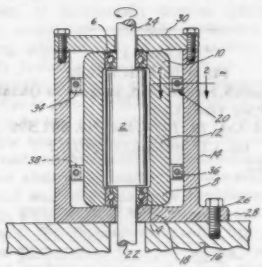
3,958,140
GENERATOR CONTAINMENT SYSTEM

John J. Horgan, Wethersfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1974, Ser. No. 534,315

Int. Cl.² H02K *5/24*

U.S. Cl. 310—89 **6 Claims**



1. In a containment system for a generator, the latter including a stator and a rotor within and journaled in the stator, the system including:

a surrounding case around at least a part of said stator and within which the stator and rotor are positioned and in which the stator is turnable, and

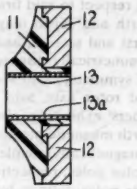
energy absorbing structures spaced around the stator and positioned between said stator and case to hold the stator in position within the case under normal loads, said structures being so oriented to permit angular movement of the stator to a limited extent in the same direction as the normal rotation of the rotor only under severe high torque above normal loadings.

3,958,141

FACE COMMUTATOR

Roy Price Bowcott, Solihull, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Aug. 28, 1975, Ser. No. 608,767
Int. Cl.² H01R 39/06
U.S. Cl. 310—237 1 Claim



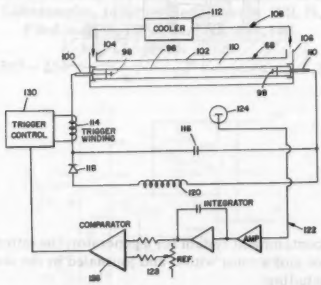
1. A face commutator comprising a moulded synthetic resin body arranged to be secured to a dynamo electric machine rotor shaft for rotation therewith, the body carrying a plurality of conductive segments disposed on the body in a circle having its centre on the rotational axis of the body, said segments extending radially with respect to said axis with front faces thereof generally co-planar and rear faces thereof presented to the body, each segment being keyed into the moulded body at both the radially inner and radially outer ends of its rear face and each segment having in its rear face a channel the radially outermost wall of which is defined by a pair of rearwardly extending, circumferentially divergent, integral projections which key the radially outer end of the segment into the moulded body, and the other wall of said channel being defined by a rearwardly extending lug adjacent the radially inner end of the segment, the face of said lug presented to said pair of projections being under-cut and so providing keying between the segment and the body at the radially inner end of the segment.

3,958,142

FILM DUPLICATOR

Paul N. Seitz, Zurich, Switzerland, assignor to Quantor Corporation, Mountain View, Calif.

Filed Aug. 29, 1974, Ser. No. 501,590
Int. Cl.² H01J 65/00, 61/52
U.S. Cl. 313—22 5 Claims



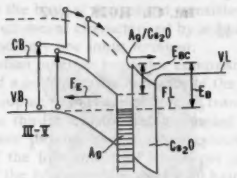
1. In a gas discharge lamp having spaced apart electrodes disposed in a gaseous atmosphere within a light transmissive body and an external trigger device disposed on an exterior surface of the body, the improvement to the external trigger device comprising an outer light transmissive member surrounding the body, and an electrically conductive light transmissive liquid disposed in a space between the body and the member and in contact with the exterior surface of the body.

3,958,143

LONG-WAVELENGTH PHOTOEMISSION CATHODE

Ronald L. Bell, Woodside, Calif., assignor to Varian Associates, Palo Alto, Calif.

Continuation-in-part of Ser. No. 323,552, Jan. 15, 1973, abandoned. This application Mar. 8, 1974, Ser. No. 449,292
Int. Cl.² H01J 39/06, 31/26
U.S. Cl. 313—94 2 Claims



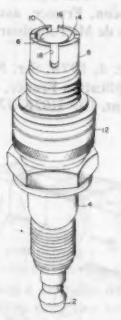
1. In a photoemitter cathode for producing electron emission into vacuum, a semiconductor body comprising a mixed III-V semiconductor compound having a photoemission surface, and an activation layer on said photoemission surface, said semiconductor compound having a composition such that said semiconductor compound is direct gap, having a direct-gap conduction band valley, but having an indirect-gap conduction band valley lying at most 0.2 eV above the bottom of the direct gap conduction band valley, said indirect-gap valley having a higher density of states than said direct gap valley, whereby electron emission is promoted from said indirect gap valley through said photoemission surface.

3,958,144

SPARK PLUG

Harry E. Franks, 60 Beacon St., Chestnut Hill, Mass. 02167

Continuation of Ser. No. 402,485, Oct. 1, 1973, abandoned, and a continuation-in-part of Ser. No. 242,608, May 22, 1972. This application Nov. 22, 1974, Ser. No. 526,402
Int. Cl.² H01T 13/20
U.S. Cl. 313—138 2 Claims



1. A spark plug comprising a mounting body and outer and inner electrodes carried by said body extending forwardly therefrom and separated from each other by a space constituting a spark gap, said outer electrode having an inner surface of revolution opposing said inner electrode across said spark gap, said inner electrode having an outer surface parallel to the opposing surface of said outer electrode to provide a large number of alternate sparking paths through said gap;

both of said electrode surfaces being formed of an alloy consisting of 75% nickel, 15% chromium, 5% iron, and the remainder copper.

3,958,145

HIGH PRESSURE, MERCURY VAPOR, METAL HALIDE DISCHARGE LAMP

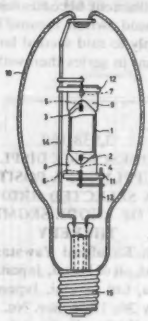
Alexander Gray Jack, and Wiggert Kroontje, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 14, 1974, Ser. No. 442,654

Claims priority, application Netherlands, Mar. 6, 1973, 7303079

Int. Cl.² H01J 61/20, 61/22

U.S. Cl. 313—184 12 Claims



1. A high pressure mercury vapour discharge lamp having a discharge vessel provided with electrodes between which the discharge is maintained during operation and comprising a quantity of rare gas as a starting gas and furthermore between 0.5 and 25 mg of mercury and between 1 and 30 μg mol of at least one of the halides of tin per cubic cm of contents of the discharge vessel, wherein the contents of the discharge vessel comprises at least one of the halides of lithium.

3,958,146

FAST WARM UP PICTURE TUBE CATHODE CAP HAVING HIGH HEAT EMISSIVITY SURFACE ON THE INTERIOR THEREOF

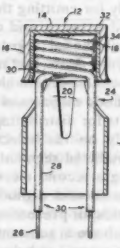
William E. Buescher, and Donald R. Kerstetter, both of Emporium, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Feb. 8, 1974, Ser. No. 440,683

The portion of the term of this patent subsequent to Apr. 29, 1992, has been disclaimed.

Int. Cl.² H01J 1/14, 19/06; H01K 1/04

U.S. Cl. 313—346 R 4 Claims



1. In a fast warm up cathode which comprises a hollow cathode stack, a substantially cup-shaped cathode cap, minimum area contact means joining said stack and said cap, and a heater positioned within said cap and said stack, the improvement comprising: an inner layer of a high heat radiating material which is substantially black on the interior of said cap, said inner layer being an alloy comprised essentially of about 20% chromium with the remainder essentially nickel.

3,958,147

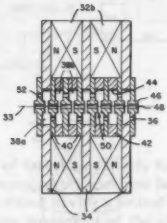
TRAVELING-WAVE TUBE WITH IMPROVED PERIODIC PERMANENT MAGNET FOCUSING ARRANGEMENT INTEGRATED WITH COUPLED CAVITY SLOW-WAVE STRUCTURE

Melvin E. Triplett, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed June 6, 1975, Ser. No. 584,681

Int. Cl.² H01J 25/34

U.S. Cl. 315—3.5 1 Claim



1. A device for focusing a stream of electrons and constraining it to flow along a predetermined path and for providing a series of electromagnetically intercoupled interaction cavities arranged sequentially along said predetermined path in electromagnetic interacting relationship with said stream of electrons, comprising:

a plurality of substantially annular permanent magnets magnetized axially and coaxially disposed about said predetermined path with like poles of adjacent magnets confronting one another;

a plurality of substantially annular ferromagnetic pole pieces respectively coaxially interposed between and abutting adjacent ones of said magnets and extending radially inwardly of said magnets to a radial distance substantially outwardly of said predetermined path, each of said pole pieces defining a cylindrical aperture therethrough having a circumferential surface which constitutes the lateral wall of one of said interaction cavities;

first, second and third substantially annular plate-like members of electrically conductive non-magnetic material disposed coaxially about said predetermined path and radially within each of said magnets, said first and third plate-like members abutting and being hermetically bonded to the respective pole pieces abutting opposite ends of the said magnet, said second plate-like member being disposed axially substantially midway along the length of the said magnet;

first and second substantially annular spacer members of electrically conductive non-magnetic material disposed coaxially about said predetermined path and radially within each of said magnets, said first spacer member being disposed axially between and abutting said first and second plate-like members and being hermetically bonded thereto, said second spacer member being disposed axially between and abutting said second and third plate-like members and being hermetically bonded thereto, each of said spacer members defining a cylindrical aperture therethrough having a circumferential surface which constitutes the lateral wall of one of said interaction cavities;

each of said plate-like members extending radially inwardly of said pole pieces and spacer members to the vicinity of said predetermined path, the broad surfaces of said plate-like members consituting end walls of said interaction cavities, said plate-like members defining aligned aper-

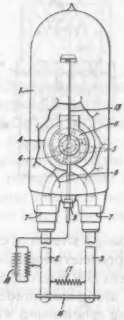
tures in their respective central regions to provide a passage for said stream of electrons, and each said plate-like member further defining a coupling hole therethrough in a region radially outwardly of its central region for intercoupling adjacent interaction cavities.

3,958,148

RADIO FREQUENCY NOISE GENERATING MAGNETRON

Donald A. Wilbur, Albany, and Philip H. Peters, Jr., Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 11, 1952, Ser. No. 303,725
Int. Cl.² H01J *25/50*
U.S. Cl. 315—39.65 **12 Claims**



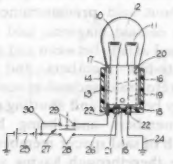
1. A magnetron discharge device for noise generation comprising an elongated cathode, a plurality of spaced anode segments surrounding said cathode to define a cylindrical space charge chamber, and means for establishing a radial electric field between said cathode and said anode segments for imparting an average rotational velocity about the cathode to an electronic space charge when a magnetic field is axially directed through the space charge chamber, said spaced segments and the gaps between them differing in relative widths whereby electrons traveling under different segments and gaps have different transit times.

3,958,149

MOTOR VEHICLE REAR LIGHTING SYSTEM

Stanley Green, West Midlands, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Apr. 30, 1975, Ser. No. 573,257
Claims priority, application United Kingdom, May 28, 1974, 23632/74
Int. Cl.² H01J *7/44*
U.S. Cl. 315—66 **4 Claims**



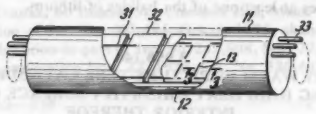
1. A motor vehicle rear lighting system comprising a light bulb having an electrically conductive body, first and second filaments mounted in said bulb, first and second contacts on the bulb, one end of said first filament being connected with said electrically conductive body, an opposite end of said first filament being connected to said first contact, one end of said second filament being connected with said electrically conductive body, an opposite end of said second filament being connected with said second contact, an electrical source, and an electrical switch means movable between one position and another position, said electrical switch means being connected in a circuit with the source and the bulb so that, in said one position, said supply is connected with said first contact and, in said another position, said supply is connected with said electrically conducting body of said bulb, said circuit being completed in both of said positions of said switch means by way of said second contact so that, in said one position of said switch means, said filaments are connected in series with said supply and said first filament becomes luminous, and, in said another position of said switch means, said circuit is completed from said supply to said second lamp filament without said first lamp filament in series therewith.

3,958,150

MULTI-DIGIT LUMINESCENCE DISPLAY TUBE HAVING MEANS FOR SUPPLYING A POSITIVE OR ZERO VOLTAGE TO A SELECTED GRID TO SUPPRESS LUMINESCENCE OF ANODE SEGMENTS COVERED THEREBY

Masaki Kobayakawa; Kazufumi Yawata; Hideo Murayama, and Itsuo Matsusaki, all of Izumi, Japan, assignors to Nippon Electric Kagoshima, Ltd., Izumi, Japan

Filed July 30, 1974, Ser. No. 493,656
Claims priority, application Japan, July 31, 1973, 48-86617
Int. Cl.² H01J *1/66, 63/06;* **H05B** *37/00*
U.S. Cl. 315—169 TV **5 Claims**



1. In a multi-digit luminescence display tube comprising an evacuated sealed envelope having a light transparent portion, an anode assembly within said envelope disposed in a facing relationship with said envelope transparent portion, said anode assembly including an insulating substrate and a plurality of luminescent anode segments formed on said substrate for each of a plurality of digits, cathode means disposed in front of said anode assembly for emitting thermal electrons, a plurality of grids disposed between said cathode means and the anode segments in substantial registration with the anode segments of the respective digits, first means for supplying first electric voltages between said cathode means and said grids and between said cathode means and at least a selected one of said anode segments for distributing the thermal electrons substantially uniformly on the selected anode segment to make said electron-irradiated segment luminesce, and second means for superposing a second electric voltage on the first voltage supplied between said cathode means and at least a selected one of said grids for preventing those anode segments from luminescing which are in substantial registration with the selected grid, the improvement being wherein said cathode means comprises a common filament for the anode segments of all digits, and further comprising third means for rendering said second voltage non-negative and greater than zero such that the luminescence of that selected anode segment which is not in substantial registration with the selected grid is not adversely affected.

3,958,151

METHOD AND APPARATUS FOR DRIVING A PLASMA DISPLAY PANEL WITH APPLICATION OF OPPOSITE PHASE SUPPRESSION PULSES TO SELECTION ELECTRODES

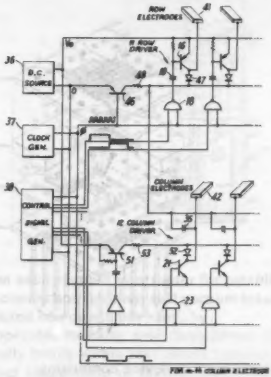
Akira Yano; Norio Sato, and Tunekiyo Iwakawa, all of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed Oct. 17, 1973, Ser. No. 407,284

Claims priority, application Japan, Oct. 18, 1972, 47-104245

Int. Cl.² H05B 37/00

U.S. Cl. 315—169 TV **3 Claims**



1. In combination in plasma display apparatus, an electrode discharge display panel including first and second electrode groups, and a plurality of gas discharge cells disposed at the spacial intersection of the electrodes of said electrode groups, drive means for energizing said electrodes in a time division manner, said electrode energizing drive means comprising means for sequentially energizing the electrodes of said first electrode group with pulse trains of a first polarity, means for energizing said electrodes of said second group with pulse trains of a second polarity opposite to said first polarity, combinations of said electrodes in said second group being coincidentally excited in accordance with the display desired, a suppression source of pulses of said first polarity, and capacitance means coupling said suppression source to said electrodes of said second electrode group for cancelling voltages spuriously induced therein when selected of said second electrode group are energized by said second electrode group energizing means.

3,958,152

PROTECTION CIRCUITRY FOR CATHODE RAY TUBES

Orvel Douglas Fogg, and Eugene Kenneth Severson, both of Colorado Springs, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 23, 1973, Ser. No. 390,976

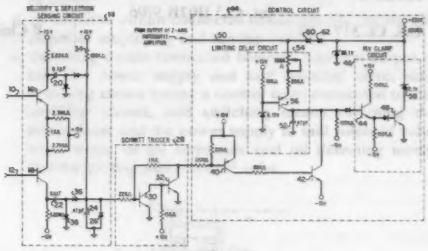
Int. Cl.² H01J 29/52

U.S. Cl. 315—381 **2 Claims**

1. Circuitry for protecting a cathode ray tube against excessive beam intensity, the circuit comprising:

sensing means for detecting movement of a cathode ray tube electron beam and for issuing a signal that is indicative of beam movement insufficent to allow continuous full beam intensity; and

control means coupled to the sensing means and to an intensity line, the control means being responsive to the signal issued by the sensing means for clamping the intensity line to a predetermined maximum voltage limiting beam intensity to a level such that a visible indication of the electron beam is provided but such that damage to the cathode ray tube is prevented, the control means being further responsive to initiation of movement of the electron beam subsequent to a period of time during which the electron beam has been stationary at minimum intensity for providing increased beam intensity including full beam intensity, as selected by the user, for a predeter-



mined period of time immediately following such initiation of movement of the electron beam, said predetermined period of time having a limited duration permitting the user to view movement of the electron beam while preventing damage to the cathode ray tube, and wherein the control means includes a limiting delay circuit for inhibiting limiting of the intensity of electron beam during said predetermined period of time.

3,958,153

METHOD AND APPARATUS FOR FAULT DETECTION IN A THREE-PHASE ELECTRIC NETWORK

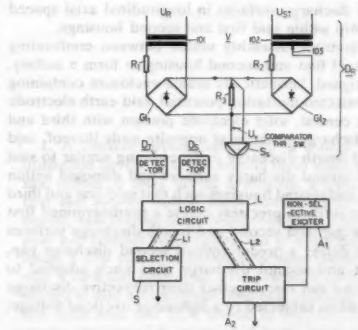
Venkat Narayan, Spreitenbach, Switzerland, assignor to Brown, Boveri & Co., AG, Baden, Switzerland

Filed May 14, 1974, Ser. No. 469,780

Claims priority, application Switzerland, June 7, 1973, 8249/73

Int. Cl.² H02H 3/28

U.S. Cl. 317—27 R **14 Claims**



1. A method for determining faults in a grounded-neutral three-phase network comprising the steps of preparing a first signal representing the amplitude of a first phase-to-ground voltage (U_R), preparing a second signal representing the amplitude of the interphase voltage (U_{ST}) between the two other phases, comparing said first and second signals and generating a fault signal (F_R) in dependence on such comparison signal exceeding a predetermined critical value (U_*).

3,958,154

DUPLEX SURGE ARRESTORS

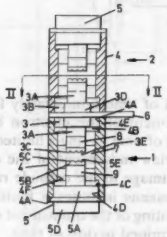
John Hill, Bickley; Henryk Turczanski, Beckenham, and Frederick Henry Wallis, Turnbridge Wells, all of England, assignors to Comtelco (U.K.) Limited, Tonbridge, England

Filed Nov. 20, 1974, Ser. No. 525,622

Claims priority, application United Kingdom, Nov. 20, 1973, 53725/73

Int. Cl.[2] H02H 9/06

U.S. Cl. 317—62 8 Claims



1. A duplex surge arrestor comprising:

first and second electrically insulative housing;

first and second solid conductive line electrodes having respective similar predetermined first and second discharge surface configurations, said electrodes sealed to respective ends of said first and second housings to position said discharge surfaces in longitudinal axial spaced relationship within said first and second housings;

an earth electrode assembly sealed between confronting ends of said first and second housing to form a unitary, axially aligned, hermetically sealed enclosure containing a gas of selected ionization potential, said earth electrode having a central, solid electrode portion with third and fourth discharge surfaces at opposite ends thereof, said third and fourth discharge surfaces being similar to said first and second discharge surfaces and disposed within said first and second housings such that said first and third discharge surfaces precisely define a predetermined first discharge gap and second and fourth discharge surfaces precisely define a predetermined second discharge gap, said first and second discharge gaps each adapted to break down and fuse together their respective discharge surfaces when subjected to a high surge overload voltage; and

gas communication means through the periphery of said earth electrode assembly between the electrode portion of said earth electrode assembly and the facing surface of said first and second housings and providing gas communication between said first and second housings such that when one of the line electrodes is subjected to a high overload voltage, gas within the respective housing is ionized and conveyed to the other housing to substantially reduce the breakdown potential of the remaining discharge gap.

3,958,155

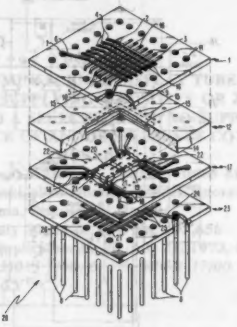
PACKAGED MAGNETIC DOMAIN DEVICE HAVING INTEGRAL BIAS AND SWITCHING MAGNETIC FIELD MEANS

Wilhelm E. Bogholtz, Wappingers Falls; Louis J. Bosch, Hopewell Junction; Robert A. Downing, Poughkeepsie; James R. Kiseda, Hopewell Junction; Albert A. Lennon, Jr., Poughquag; Alfred A. Rifkin, Wappingers Falls, and Edgar W. Scott, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 265,034, June 21, 1972. This application June 29, 1973, Ser. No. 375,274

Int. Cl.[2] H05K 5/00

U.S. Cl. 317—101 CM 6 Claims



1. A magnetic domain device comprising:

a magnetic domain device chip containing ferromagnetic cylindrical domain supporting material,

a pair of printed circuit layers facing opposite surfaces of said chip;

each said layer comprising:

an insulating substrate having striped conductive patterns orthogonally oriented relative to each other on the opposite surfaces of said substrate,

first conductive means connecting the ends of the striped conductors on one surface of one layer to the ends of the striped conductors on one surface of the other layer to form a first switching coil

second conductive means connecting the ends of the striped conductors on the other surface of said one layer to the ends of the striped conductors on the other surface of said other layer to form a second switching coil orthogonally oriented relative to said first coil,

a plurality of conductive pins,

each said layer being apertured to permit penetration by said pins,

third conductive means connecting the ends of each said coil to respective ones of said pins, and

a permanent magnet surrounding said coils and providing a magnetic field perpendicular to said magnetic domain device chip.

3,958,156

VACUUM INTERRUPTER METAL-CLAD SWITCHGEAR VERTICALLY ELEVATABLE WITHIN COMPARTMENT

John O. Tjebben, Wauwatosa, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 21, 1974, Ser. No. 516,808

Int. Cl.[2] H02B 11/18; H01H 33/42, 9/22

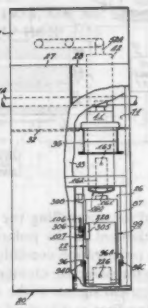
U.S. Cl. 317—103 23 Claims

1. Enclosed switchgear including an enclosure defining a three phase circuit breaker compartment having a longitudinal axis;

a plurality of main bus conductors and a plurality of load bus conductors extending into said three phase circuit

breaker compartment, said bus conductors being positioned vertically and arranged in a horizontal line;

a three phase circuit breaker having a longitudinal axis, said circuit breaker being movable into and out of said circuit breaker compartment in a direction parallel to its longitudinal axis, said circuit breaker being provided with a plurality of vacuum interrupters arranged vertically in a single horizontal line parallel to the longitudinal axis of said circuit breaker, one for each associated bus conductor;



means on each vacuum interrupter for establishing an electrical connection between said vacuum interrupter and an associated bus conductor; and,

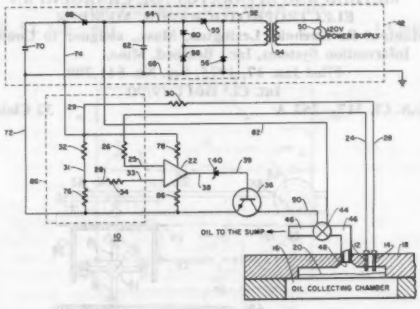
means operable to move said three phase circuit breaker vertically bodily within said circuit breaker compartment to effect engagement of said means on each of said vacuum interrupters with associated ones of said bus conductors to establish electrical engagement therebetween.

3,958,157

OIL LEVEL DETECTION CIRCUIT

Kwang-ta Huang, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 12, 1975, Ser. No. 549,396
Int. Cl.² G05D 9/12
U.S. Cl. 317—123 **7 Claims**



1. An oil level detection circuit for detecting the level of oil floating on water in an oil-collecting chamber and for controlling a solenoid valve located in a tube utilized for removing the oil from said chamber comprising:

a. a first and second electrode both extending downwardly into said oil collecting chamber a specific first distance and being spaced apart a specific second distance, both said specific first distance and said specific second distance being variable, said specific second distance determining the sensitivity of said sensing circuit;

b. a d-c power supply having a first and second output; said second output being connected to said solenoid valve;

c. a sensing circuit having a variable sensitivity capability connected to said oil detecting means, said sensing circuit having a sensing current flowing therein whenever said detecting means detects water or air in said oil-collecting chamber;

d. an amplifier circuit connected to said sensing circuit, said amplifier amplifying and sensing current;

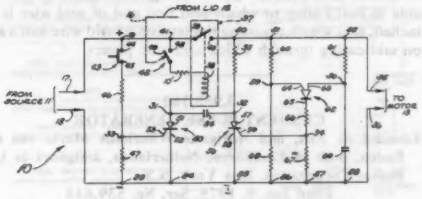
e. switching means connected between said first output of said d-c power supply and said solenoid valve, said switching means having a control input connected to said amplifier circuit, said switching means switching d-c power from said d-c power supply to said solenoid valve when water or air surrounds said oil detecting means thereby closing said solenoid valve.

3,958,158

HEAD

Larry K. Dart, Costa Mesa, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 10, 1975, Ser. No. 556,845
Int. Cl.² E03D 13/100
U.S. Cl. 317—141 S **6 Claims**



1. A control circuit comprising: a source of potential; a utilization device; first and second input leads connected from said source; a relay having a winding, a pole and a contact; first and second output leads connected to said utilization device, said second leads being connected together, said relay pole and contact being connected in series between said first leads; a first silicon controlled rectifier (SCR) having an anode, a cathode and a gate, said first SCR cathode being connected to said second leads, said relay winding being connectible from said first SCR anode to said first input lead; first means connected between said input leads for supplying a voltage and current to said first SCR gate at a predetermined time to cause said first SCR to fire, to cause said relay winding to be energized and to cause said relay pole to engage said relay contact; and second means connected between said output leads for supplying a potential to said first SCR anode at least momentarily the same as that on said second leads in a manner to cut off said first SCR, to deenergize said relay winding and to cause disengagement of said relay pole from said relay contact at a time later than said predetermined time.

3,958,159

CAPACITANCE PROBE AND SYSTEM FOR PRECISION MEASUREMENT OF LIQUID LEVEL

George P. Rauchwerger, c/o Expo Instruments Inc., 183-D Commercial Ave., Sunnyvale, Calif. 94086

Continuation-in-part of Ser. No. 309,735, Nov. 27, 1972, Pat. No. 3,864,974, which is a continuation-in-part of Ser. No. 105,254, Jan. 11, 1971, Pat. No. 3,710,244. This application Dec. 26, 1974, Ser. No. 536,347

Int. Cl.² G01F 23/26

U.S. Cl. 317—246 7 Claims

1. A probe of the character described comprising a flexible wire metallic member, insulation surrounding said metallic member and mounting means for holding said probe taut in a container of liquid to be measured, said mounting means comprising anchoring means anchoring a first end of said wire and a head for a second end of said wire securing said wire taut, said head comprising a water-tight casing, a winch rotatable in said casing to which said first end of said wire is attached, said winch adjusting the tension of said wire and a seal on said casing through which said wire passes.

3,958,160

CURRENT PULSE GENERATOR

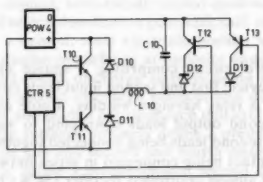
Edmond de Niet, and Adrianus Wilhelmus Maria van den Enden, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 9, 1975, Ser. No. 539,614

Claims priority, application Netherlands, Feb. 1, 1974, 7401401

Int. Cl.² H01H 47/32

U.S. Cl. 317—148.5 R 7 Claims



1. A device for generating a time-dependent current, comprising

at least three current connection terminals of different potential;

an oscillator circuit;

control means, connected to said oscillator circuit; and

two switching means, each having a first terminal connected to a respective current connection terminal of extreme potentials, a second terminal connected to said oscillator circuit, and a third terminal connected to said control means, said two switching means being operative to control the current to said oscillator circuit.

3,958,161

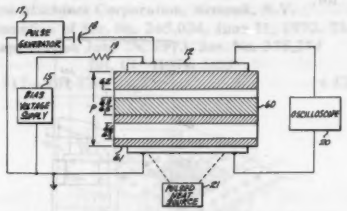
METHOD OF CONTROLLING THE POLARIZATION CONDITION OF TRANSDUCERS

Norman E. Dixon, Pasco, Wash., assignor to Battelle Development Corporation, Columbus, Ohio

Filed Mar. 12, 1973, Ser. No. 340,190

Int. Cl.² H01L 41/18; B01J 17/00

U.S. Cl. 317—262 F 13 Claims



1. A method for controlling the polarization condition of a ferroelectric element as the polarization condition is altered from an initial polarization condition to a selected polarization condition, the ferroelectric element having a known response to applied electrical signals at the selected polarization condition, and having first and second generally opposed surfaces with a peripheral surface therebetween, comprising the steps of:

altering the initial polarization condition of a portion of the ferroelectric element, said portion extending from the first opposed surface inwardly of the ferroelectric element;

applying an electrical signal to at least one of the first and second opposed surfaces of the ferroelectric element;

sensing an electrical response of the ferroelectric element of at least one of the first and second opposed surfaces to said applied electrical signal;

comparing the sensed electrical response with the known response; and

repeating said steps of altering, applying, sensing and comparing for successive portions of the ferroelectric element inwardly thereof until said sensed electrical response is substantially identical with the known response.

3,958,162

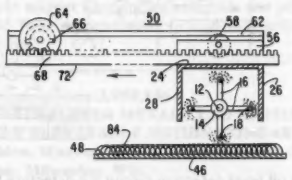
METHOD AND APPARATUS FOR CHARGING AN ELECTROPHOTOGRAPHIC MEMBER

Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Information Systems, Inc., Bedford, Mass.

Filed Jan. 17, 1975, Ser. No. 541,708

Int. Cl.² H01T 19/00

U.S. Cl. 317—262 A 32 Claims



9. A corona discharge apparatus for charging an electrophotographic member including in combination:

corona producing means including a plurality of elongate spaced apart corona electrodes each having an axis extending parallel to a central axis and positioned a first predetermined distance therefrom and each developing a

zone of corona along the length thereof in response to an applied corona voltage, and

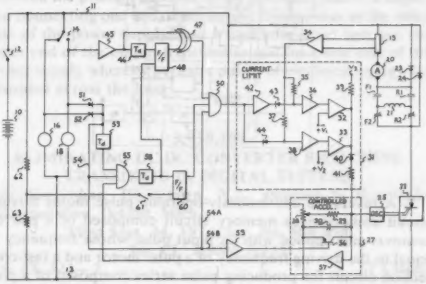
rotational drive means coupled to said corona producing means for rotating said electrodes about said central axis, whereby a plurality of substantially uniform and parallel zones of corona charge is applied to said member.

3,958,163

METHOD AND APPARATUS FOR PLUG SENSING

Robert C. Clark, Roanoke, Va., assignor to General Electric Company, New York, N.Y.

Filed Nov. 20, 1974, Ser. No. 525,296
Int. Cl.² H02P *3/10*
U.S. Cl. 318—373 **6 Claims**



1. In a DC electric traction motor control system of the type including a time ratio controlled switching means for controlling motor current, a plug sensing circuit comprising:

logic means responsive to a signal representative of a direction change command for said motor for initiating a plug current limit signal for at least a predetermined time period; and

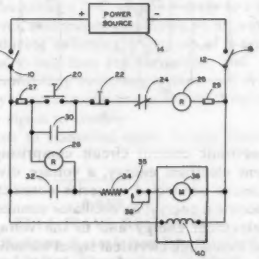
inhibit means responsive to a signal representative of the percentage on time of said switching means for extending said predetermined time period until said percentage on time achieves a predetermined time ratio.

3,958,164

PROTECTIVE PANEL CIRCUIT

Edward L. Hess, Hellertown, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Dec. 10, 1974, Ser. No. 531,269
Int. Cl.² H02P *1/04;* **H02H** *7/08*
U.S. Cl. 318—431 **1 Claim**



1. In a system comprising:

a. an electric motor;

b. a motor power circuit for said motor;

c. a motor control circuit in series with said motor power circuit, said control circuit including means for manually opening said circuit;

d. a normally open re-set switch;

e. a normally closed stop switch in series with said re-set switch;

f. a line contactor in series with said reset and said stop switches, said line contactor when energized effecting the closing of first normally open contacts in series with said motor power circuit and second normally open contacts in parallel with said re-set switch; and

g. a power source connected across the series connection of said first normally open contacts, said motor control circuit, and said motor power circuit;

the improvement comprising:

a protective relay comprising a coil and normally closed contacts;

said coil being in parallel with said first normally open contacts;

said coil having a high impedance relative to the impedance of said motor power circuit;

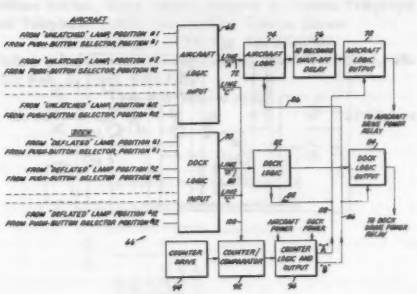
said normally closed contacts being in series with the coil of said line contactor whereby energization of said protective relay de-energizes said line contactor and prevents re-energization thereof until said motor control circuit has been manually opened.

3,958,165

CARGO TRANSFER SHUTOFF SYSTEM

Roger Boy de la Tour, Los Angeles, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 29, 1974, Ser. No. 528,170
Int. Cl.² H02P *3/00*
U.S. Cl. 318—467 **6 Claims**



1. For use in a vehicle cargo loading system and a cooperating dock cargo loading system, a cargo transfer shutoff system comprising:

vehicle logic input means for comparing at least one command signal representative of a corresponding at least one load position selected to be loaded in said vehicle with at least one status signal representative of existing conditions at said at least one load position selected in said vehicle, and producing a first output signal when said existing conditions at all load positions selected in said vehicle are indicative of a loaded status at each of said load positions selected in said vehicle;

vehicle logic means for receiving said first output signal and adapting it into a vehicle drive control signal;

vehicle logic output means responsive to said vehicle drive control signal to shut off drive means of said vehicle cargo loading system when said vehicle logic output means receives said vehicle drive control signal from said vehicle logic means;

dock logic input means for comparing at least one command signal representative of a corresponding at least one load position selected to be loaded on said dock with at least one status signal representative of existing conditions at said at least one load position selected on said dock, and producing a second output signal when existing

conditions at all load positions selected on said dock are indicative of a loaded status at each of said load positions selected on said dock;

dock logic means for receiving said second output signal and adapting it into a dock drive control signal; and

dock logic output means responsive to said dock drive control signal to shut off drive means of said dock cargo loading system when said dock logic output means receives said dock drive control signal from said dock logic means,

whereby said vehicle drive means is shut off when all loads have been transferred to their selected vehicle positions during a vehicle loading operation and said dock drive means is shut off when all loads have been transferred to their selected dock positions during a vehicle unloading operation.

3,958,166

SPEED ADJUSTING APPARATUS

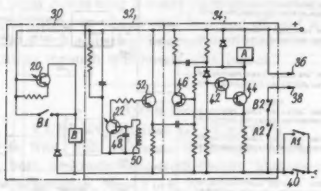
Arthur Raymond Bailey, Bingley, and John Peter Edgar, London, both of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 341,601, March 15, 1973. This application Sept. 17, 1974, Ser. No. 506,779

Claims priority, application United Kingdom, Mar. 16, 1972, 12296/72

Int. Cl.² G05B *11/00*

U.S. Cl. 318—687 **12 Claims**



1. A linear electric motor comprising:

a linear motor primary member arranged to be energised by a current supply;

a linear motor secondary member designed for acceleratory and deceleratory movement along an axis of said primary member when said primary member is energized;

switching means operative to disconnect the supply of current to said primary member and to maintain the supply disconnected, when the secondary member has been subject to acceleration at least until said secondary member reaches a position outside the influence of the accelerating field of the primary member and, when the secondary member has been subject to deceleration, at least until that member comes to rest; and

control means whereby said switching means is operated when the speed of said secondary member reaches a predetermined value, wherein said control means comprises:

sensing means responsive of movement of said secondary member to produce a signal the frequency of which is dependent upon the speed of said movement, and

comparator means responsive to said frequency signal from said sensing means to produce a switching signal effective to operate said switching means when the frequency of said frequency signal reaches a value corresponding to said predetermined value of speed.

3,958,167

PULSE MOTOR

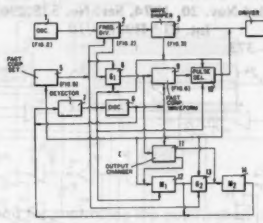
Fumio Nakajima, Tokyo; Akira Nikaido, Fuchu; Mitsuo Onda, Oomiya; Takayasu Machida, Iruma, and Takashi Toida, Tokyo, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1973, Ser. No. 420,698

Claims priority, application Japan, Dec. 4, 1972, 47-121402; Nov. 15, 1973, 48-128551

Int. Cl.² H02P *7/00*

U.S. Cl. 318—696 **5 Claims**



1. A reversible continuously-operable pulse motor driving circuit comprising a memory circuit composed of a pair of counters and applied with an input pulse whose frequency is equal to the driving frequency of a pulse motor and a fast-correction circuit for producing pulse series composed of a plurality of pulse phases whose frequency is higher than the frequency ordinarily defined for driving said pulse motor, whereby said pulse series are applied to said pulse motor by required steps to rotate said pulse motor in either mormal or reverse direction.

3,958,168

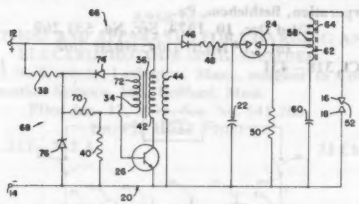
ELECTRONIC CONTROL CIRCUIT

Kenneth Grundberg, 3012 Maplewood St., Royal Oak, Mich. 48073

Continuation of Ser. No. 322,395, Jan. 10, 1973. This application Mar. 19, 1974, Ser. No. 452,572

Int. Cl.² H02M *3/335*

U.S. Cl. 321—2 **9 Claims**



1. An electronic control circuit comprising a source of direct current electrical energy, a voltage divider including three resistances connected in series connected across the source of electrical energy, an oscillator connected across the source of electrical energy and to the voltage divider for providing an oscillating electrical signal including a semi-conductor device having emitter, base and collector electrodes, a transformer having primary and secondary windings and a feedback winding, said primary winding being connected directly to one side of the source of electrical energy at one end thereof and to the collector of the semi-conductor device at the other end thereof, the emitter of the semi-conductor device being connected to the other side of the power supply, said transformer feedback coil having a tap connected directly

to the base of the semi-conductor device, a unidirectional device connected between one end of the feedback coil at one side thereof and to a point between a first and second of the three resistances in the voltage divider, the other end of the feedback coil being connected to a point on the voltage divider between the second and third resistances thereof, and a Zener diode connected on one side between the first and second resistances of the voltage divider and at the other side to the other side of the power supply, a second unidirectional device, a resistance and an energy storing capacitor connected in series across the secondary winding of the transformer, a spark gap and resistance connected in series across the energy storage capacitor, and output structure including an output transformer having primary and secondary portions connected between the series connected spark gap and resistance between the primary and secondary portions thereof, a capacitor connecting one end of the output transformer to the other side of the power supply, and a load connected between the other end of the output transformer and the other side of the power supply whereby periodic pulses of electrical energy are provided across the load.

3,958,169

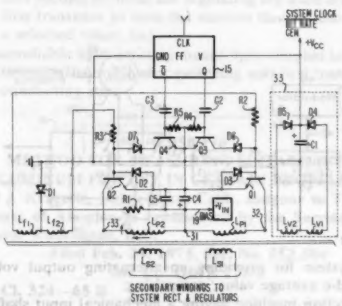
ELIMINATING DC-DC CONVERTER SWITCHING TRANSIENTS IN DIGITAL SYSTEMS

Odo Hergenhan, Hightstown, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sept. 24, 1974, Ser. No. 508,894

Int. Cl.² H02M 3/335

U.S. Cl. 321—2 **17 Claims**



1. In conjunction with a digital system wherein data representation depends at least in part on a fixed frequency signal, a power supply system comprising:

means for converting a D.C. supply voltage to a second D.C. voltage level, said means employing an intermediate A.C. stage producing switching transients of a type normally deleterious to said data representation; and

means for controlling switching within said A.C. stage to occur only in synchronization with switching of said fixed frequency signal to confine

said transients to transition times in said fixed frequency signal.

3,958,170

FULL WAVE RECTIFIERS

Duncan Barry Hodgson, Leamington Spa, England, assignor to Joseph Lucas Limited, Birmingham, England

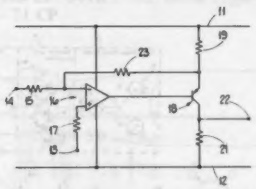
Filed Apr. 24, 1975, Ser. No. 571,413

Claims priority, application United Kingdom, May 21, 1974, 22530/74

Int. Cl.² H02M 7/00

U.S. Cl. 321—8 R **2 Claims**

1. A full wave rectifier comprising in combination positive and negative supply lines, a differential input amplifier which is powered by the positive and negative supply lines and has its inverting input terminal connected through an impedance to an input terminal to which the a.c. signal to be rectified is fed, the non-inverting input terminal of the differential input amplifier being connected to a terminal at a potential intermediate the positive and negative supply lines, and a transistor



having its base connected to the output terminal of the differential input amplifier and its emitter and collector connected through resistors to the supply lines, the emitter of the transistor being connected through an impedance to the inverting input terminal of the differential input amplifier and the output of the full wave rectifier being taken from the collector of the transistor.

3,958,171

INVERTER CONTROLLING DEVICE

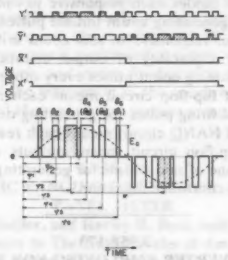
Yoshihiro Sekino, Hoya, Japan, assignor to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Mar. 10, 1975, Ser. No. 556,801

Claims priority, application Japan, Mar. 11, 1974, 49-27237; Feb. 3, 1975, 50-13328

Int. Cl.² H02M 1/12

U.S. Cl. 321—9 A **11 Claims**



1. An inverter controlling device comprising a direct current source, a bridge inverter connected to said direct current source and having a plurality of switching elements in bridge arms for converting a direct current from said source to an alternating current, and a controlling means for operating said switching elements in a predetermined sequence,

said controlling means being adapted to divide each half cycle of a basic wave voltage into an even number of sections respectively having an equal phase interval and produce a pulse voltage at the center of each of said sections,

to render the width of said pulse voltages in each half cycle to be wider sequentially as they approach the center of the cycle than that of the pulse voltages at both ends of the cycle with a predetermined ratio, and

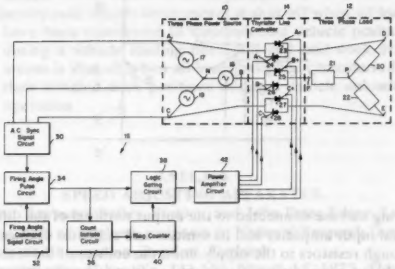
to produce as inverter output a plurality of similar pulse voltages to a pulse train consisting of said pulse voltages.

3,958,172

FREQUENCY REDUCTION AND POWER CONTROL CIRCUIT FOR THYRISTOR LINE CONTROLLERS

William H. Beck, Palos Verdes, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 18, 1974, Ser. No. 516,233
Int. Cl.² H02M 5/27
U.S. Cl. 321—16 14 Claims



1. A control circuit for a thyristor line controller interconnecting an alternating current voltage generating source to a load comprising:

a multi-winding transformer having a primary winding energized by the power source and secondary windings providing sinusoidal signals phased predetermined electrical degrees apart;

potentiometer means for generating a negative potential DC firing angle command signal;

a plurality of differential amplifiers each responsive to one of the sinusoidal signals and the firing angle command signal for generating a plurality of amplifier output signals;

a plurality of circuit means each responsive to one of said amplifier output signals for generating firing pulses;

a plurality of diodes each responsive to one of said firing pulses for generating count initiate pulses;

a ring counter responsive to said count initiate pulses for generating a plurality of output counts, each of said counts including count pulses every nth initiate pulse;

a plurality of flip-flop circuit means each responsive to a pair of said firing pulses for generating outputs; and

a plurality of NAND circuit means each responsive to one of said flip-flop circuit means outputs and the count pulses of one of said counts for generating trigger pulses to the line controller thyristors.

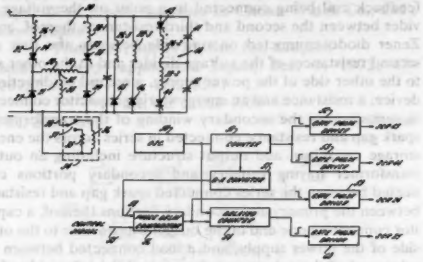
3,958,173

POWER CONVERTER EMPLOYING NON-SATURATING INTERPHASE TRANSFORMER

Clinton C. Christianson, Minnetonka, Minn., and Robert F. Bourke, Wilson, Wis., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Feb. 11, 1975, Ser. No. 548,912
Int. Cl.² H02M 7/515
U.S. Cl. 321—45 C 15 Claims

1. A power converter for use with a source of d.c. power comprising in combination, a chopper circuit having a plurality of chopper legs, each of said legs having a gate controlled thyristor therein, gating means for gating the respective thyristors out of phase with respect to each other, commutating means for commutating the respective thyristors, duty cycle control means operative upon said gating means and said commutating means for establishing the duty cycle of said chopper, interphase transformer means for combining the outputs of the respective chopper legs to produce a single chopper output, and means associated with said duty cycle control means for maintaining the duty cycles of all the legs at identical levels, thereby to produce substantially identical



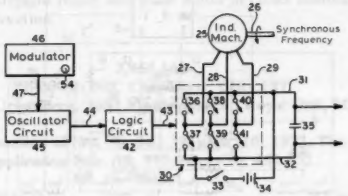
average d.c. outputs at each of the legs for preventing saturation of the interphase transformer means.

3,958,174

MODULATED INDUCTION GENERATOR

George Henry Studtmann, Mount Prospect, and Harry James Venema, Wheaton, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 16, 1975, Ser. No. 568,746
Int. Cl.² H02P 9/00
U.S. Cl. 322—47 16 Claims



1. A system for providing an alternating output voltage having a d-c average value, comprising:

an induction machine having a mechanical input shaft for receiving rotational energy at a first frequency, and having a plurality of output conductors;

a switching system, comprising an inverter circuit including a plurality of output connections coupled to the induction machine output conductors, a pair of bus conductors, a plurality of power switches, coupled both to the bus conductors and the output connections, which power switches are connected to receive gating signals to control their conduction and non-conduction, and a capacitor coupled between the bus conductors;

a logic circuit connected to apply gating signals to the power switches as a function of received timing signals;

an oscillator circuit, coupled to the logic circuit, for generating the timing signals to regulate operation of the switching system at a second frequency which is less than the first frequency; and

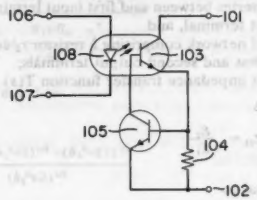
a modulator circuit, coupled to the oscillator circuit, for applying a modulating signal of given frequency to the oscillator and modifying operation of the switching system to switch at a frequency varying above and below the second frequency, thus providing on the switching system bus conductors a modulated voltage, the envelope of which varies at the given frequency of the modulating signal and as a function of the amplitude of the modulating signal.

3,958,175

CURRENT LIMITING SWITCHING CIRCUIT

Arthur Rechtman Braun, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 16, 1974, Ser. No. 533,344
Int. Cl.² G05F 3/14
U.S. Cl. 323—9 8 Claims



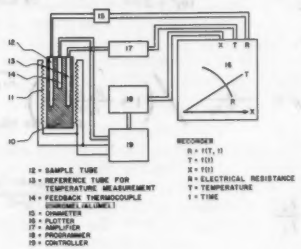
1. A current limiting circuit comprising:
first and second terminals;
photoresponsive means comprising a first transistor of one conductivity type having base, emitter, and collector terminals;
means coupling said first terminal to said collector terminal of said first transistor;
resistance means coupling said emitter terminal of said first transistor to said second terminal;
semiconductor means connected to said base terminal and said second terminal for regulating the base drive of said first transistor to limit the current flow in said circuit to a selected value; and
controllable light-emitting means light coupled to said photoresponsive means for switching said first transistor to a conducting state.

3,958,176

METHOD FOR MEASURING SUITABILITY OF ALUMINUM FOR USE IN CERTAIN PROPELLANTS

Karl J. Kraeutle, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 24, 1975, Ser. No. 552,504
Int. Cl.² G01R 27/02
U.S. Cl. 324—65 R 3 Claims



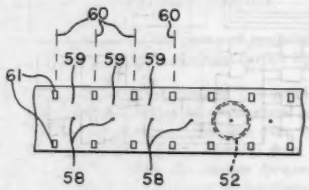
1. A method for determining whether or not aluminum powder is desirable for use as a fuel in a rocket propellant comprising the steps of:
a. simultaneously heating the powder at a controlled rate and monitoring the resistance and temperature of the powder; and
b. determining whether or not the resistance of the powder approaches a low value before or after the powder has been heated to a temperature of 660°C.

3,958,177

PARTICLE ANALYZING DEVICE WITH CHANGEABLE APERTURE MEANS

Richard A. Reeves, Creve Coeur, and James F. LaHay, St. Louis, both of Mo., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Dec. 17, 1974, Ser. No. 533,584
Int. Cl.² G01B 27/02; G01R 27/00
U.S. Cl. 324—71 CP 15 Claims



1. A device for analyzing a fluid suspension including particles and a fluid medium having a conductivity per unit volume different from that of the particles comprising fluid passageway means for passing fluid suspension therethrough for analysis, a plurality of scanning elements of plastic insulating material integrally connected together in successive order to form a unitary strip of plastic material, each of said elements having a scanning aperture therethrough with the side walls of each of said apertures being integral portions of said strip and with said apertures spaced lengthwise of said strip, said strip being formed of a material which is sufficiently flexible as to be capable of being wound upon itself into a supply roll or other configuration, means for supporting said strip for movement to selectively feed said elements, one at a time, into an operative position in said passageway means wherein the suspension can flow through the aperture of the operatively positioned element, each of said apertures being sized so that a detectable change in the conductivity of the suspension occurs in an operatively positioned aperture when a particle passes therethrough, and means for detecting a change in the conductivity of the suspension in the aperture of the operatively positioned element when a particle passes therethrough.

3,958,178

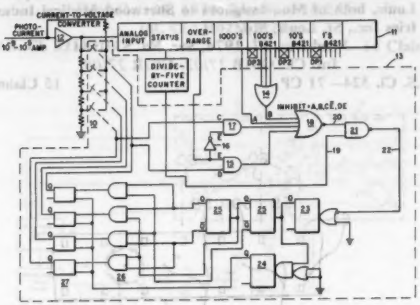
AUTOMATIC RANGING CIRCUIT FOR A DIGITAL PANEL METER

Theodore R. Mueller, and Harley H. Ross, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 11, 1975, Ser. No. 548,938
Int. Cl.² G01R 15/08, 17/06
U.S. Cl. 324—115 4 Claims

1. In a measuring system for measuring a variable signal input including a digital panel meter having a fixed sensitivity and including an end-of-conversion (STATUS) output signal, and a variable gain device connected between said signal input and said meter, the improvement comprising circuit means for automatically adjusting the gain of said gain device to provide the maximum number of significant figures for display on said meter, said means comprising a NOR gate, a plurality of logic devices connected between a plurality of outputs from said meter and said NOR gate, a NAND gate connected at its input jointly to the output of said NOR gate and to said STATUS output signal, said STATUS signal providing clock pulses to said NAND gate, a plurality of switches connected to said gain device for adjusting the gain thereof, a latch device for actuating respective ones of said switches, and switching means

connected between the output of said NAND gate and said latch device for switching selected ones of said switches in



response to a call for a range change as sensed by said logic devices.

3,958,179

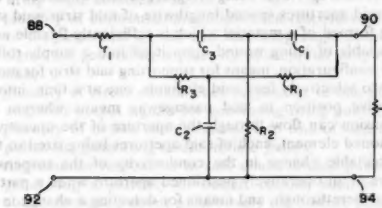
WIDE BAND AC MODULATED CONTROL NETWORKS

Van A. McAuley, 3529 Rosedale Drive, Huntsville, Ala. 35810

Division of Ser. No. 271,958, July 14, 1972. Pat. No. 3,764,878. This application Oct. 9, 1973, Ser. No. 404,832

Int. Cl.[2] H03H 7/06

U.S. Cl. 325—65 **1 Claim**



1. A twin T network adapted to be connected between a source of AC modulated carrier input signal and a controlled output for the compensation of modulation on said signal wherein the network comprises:

first and second input terminals and first and second output terminals;

resistors R_3 R_1, connected in series and comprising the top portion of a first T, and capacitor C_2 connected by one lead from the series connection of resistors R_3 and R_1 to said second output terminal and comprising the vertical portion of said first T;

capacitors C_3 and C_1 connected in series and comprising the top portion of a second T, and a resistor R_2 connected from the series connection of said last-named capacitors to said second output terminal and comprising the vertical portions of said second T;

connection means interconnecting the otherwise free terminals of resistor R_3 and capacitor C_3 together;

first circuit means for interconnecting said otherwise free terminals of resistor R_3 and capacitor C_3 to said first output terminal;

second circuit means interconnecting said second input terminal and said second output terminal;

third circuit means for interconnecting the otherwise free terminal of capacitor C_1 and resistor R_1 together and to said first output terminal;

one of said first and second circuit means comprising a resistor r_1;

a resistor r_2 connected across said output terminals;

said first impedance transfer function being that of the network comprising:

first and second input terminals and first and second output terminals,

first circuit means for directly interconnecting said second input terminal and said second output terminal,

a series first network comprising a resistor r_1 and a capacitor C_1 in series between said first input terminal and said first output terminal, and

a second network comprising a resistor r_2 connected across said first and second output terminals;

said first impedance transfer function $T(s)$ is

$$Z_{21}/Z_{11} = \frac{E_2}{E_1}$$

and is equal to

$$\frac{a_1 s}{1 + b_1 s}$$

where $a_1 = r_2 C_1$ and $b_1 = (r_1 + r_2) C_1$;

said impedance circuit having a second transfer function wherein the relationship between said first and second transfer functions is expressed by a frequency transformation

$$W^{2m} = \frac{(W_1^2 - 1)^{2m}}{(W_1 + 1)^{2m} + (W_1 - 1)^{2m}}$$

where W is the frequency variable $2\pi f$ of said first transfer function and W_1 is the frequency variable $2\pi f_1$ of said second transfer function;

said second impedance transfer function being determined by said frequency transformation to be $T(s_1)$ is

$$Z_{21}/Z_{11} = \frac{E_2}{E_1}$$

and is equal to

$$\frac{g'(1 + S_1^2)}{\left[1 + \frac{\sqrt{2[b_1(b_1^2+2)^{1/2} - (b_1^2 - 1)]^{1/2}}}{(b_1^2+2)^{1/2}} S_1 + \frac{b_1 S_1^2}{(b_1^2+2)^{1/2}}\right]}$$

where

$$g' = \frac{r_2}{r_1 + r_2} \Big/ \left(1 + \frac{R_1 + R_3}{r_1 + r_2}\right).$$

and

$$\frac{E_2}{E_1}$$

is equal to

$$\frac{g'[1+(R_1+R_3)R_2C_3S_1^2]}{\left(1+\frac{S_1}{(r_1+r_2+R_1+R_3)}\left[r_2(R_1+R_3)C_1+r_2R_3C_3+R_1R_3C_3+\right.\right.}$$

$$\left.\left.r_1C_3(r_2+R_1+R_3)+\frac{r_1(r_2+R_1+R_3)R_1C_3}{(R_1+R_3)}+r_1r_2C_1+\frac{r_1r_2r_2C_3}{R_1+R_3}\right]\right)$$

$$+S_1^2\frac{(R_1+R_2)R_2C_1C_2}{r_1+r_2+R_1+R_2}\left[r_1+r_2+\frac{r_1r_2}{R_2}+r_1+r_2+\frac{(R_1+R_2)}{R_1R_2}\right]\Bigg)$$

R_2 is greater than

$$\frac{\frac{4r_1r_2}{r_1+r_2}\left(\frac{r_2}{r_1+r_2}+\frac{R_1+R_2}{r_1+r_2}\right)}{D_1^2\left(1+\frac{R_1+R_2}{r_1+r_2}\right)^2}$$

where D_1 is equal to

$$\frac{\sqrt{2}[b_1(b_1^2+2)^{1/2}-(b_1^2-1)]^{1/2}}{(b_1^2+2)^{1/2}}$$

and R_2 is equal to

$$\frac{1}{\left[D_2\left(\frac{r_1+r_2}{r_1r_2}+\frac{R_1+R_2}{r_1r_2}\right)-\frac{(R_1+R_2)}{R_1R_2}-\frac{(r_1+r_2)}{r_1r_2}\right]}$$

from specifying values for r_1, r_2, R_1 and R_2, where

$$\frac{1}{\left(1+\frac{R_1+R_2}{r_1+r_2}\right)}$$

is made greater than D_2,

$$\frac{R_1R_2}{r_1r_2}\Big/\frac{R_1+R_2}{r_1+r_2}$$

is greater than

$$\frac{1}{D_2\left(1+\frac{R_1+R_2}{r_1+r_2}\right)-1},$$

and D_2 is equal to

$$\frac{b_1}{(b_1^2+2)^{1/2}},$$

C_3 is made equal to

$$\frac{m_1\pm(m_1^2-4m_0m_2)^{1/2}}{2m_2}$$

where

$$m_2=\left[R_2^2(R_1+R_2)(r_2+R_1)+r_1R_1R_2(r_2+R_1+R_2)\left(1+\frac{R_2}{R_2}\right)+r_1r_2R_2^2\right],$$

$$m_1=D_1R_1R_2(r_1+r_2+R_1+R_2),$$

$$m_0=\left[r_2(R_1+R_2)+R_1R_2+\frac{r_1(r_2+R_1+R_2)R_1R_2}{(R_1+R_2)R_2}+r_1r_2\frac{(R_1+R_2)}{R_1+R_2}\right];$$

where

$$C_4=\frac{1}{R_2(R_1+R_2)C_3};$$

and C_2 is made equal to

$$\frac{(R_1+R_2)R_2C_3}{R_1R_2}+\frac{1}{R_1R_2C_3};$$

and wherein the carrier frequency is the normalized frequency, $w_c=1$;

S is the Laplace complex variable operator;

b_1 satisfies $0<b_1<0.5$;

W is representative of the frequency of modulation;

W_1 is representative of the modulated carrier frequency; and

m is a positive integer in the range of 1 to infinity;

whereby said network displays an arithmetical symmetry around the carrier frequency, being an even symmetry as to gain response for a bandwidth less than, but substantially equal to, twice the carrier frequency and whereby said impedance network accomplishes a wide band AC modulated effect which affects the modulation of the modulated carrier in substantially the same way as would a network having a said first impedance transfer function and adapted to operate directly on the modulation signal alone.

3,958,180

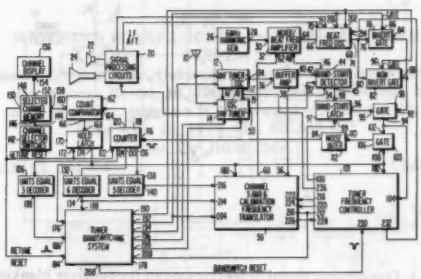
VARACTOR TUNER FREQUENCY CONTROLLER

John Barrett George, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed June 3, 1974, Ser. No. 476,082

Int. Cl.² H04B 1/34

U.S. Cl. 325—422 **9 Claims**



1. In a television tuning system for selecting any one of a plurality of television channels in at least a first band of radio frequencies by inserting into a memory data representative of said channels, and by sweeping an oscillator of a voltage controllable tuner through at least a second band of frequencies; said television channels being identified by comparing a signal from said oscillator with a plurality of harmonically related frequency samples, at least some of which are within said second band of frequencies, to develop a plurality of difference frequencies, and by accumulating in a counter data representative of the number of times one of said plurality of difference frequencies is within a predetermined frequency range during a period of sweeping of said oscillator, a system for controlling said voltage controllable tuner comprising:

means responsive to an automatic fine tuning correction voltage for providing control signals in response to a difference in frequency between said oscillator frequency and an oscillator frequency required to receive said one channel;

count comparison means coupled to said counter and said memory for providing a hold signal when data in said counter and said memory are equal;

a first current means coupled to said count comparison means and said automatic fine tuning correction responsive means for producing a first current having a substantially constant magnitude in the absence of said hold signal and a variable magnitude responsive to said automatic fine tuning voltage in the presence of said hold signal;

a second current means coupled to said count comparison means for producing a second current having a substantially constant magnitude in the presence of said hold signal;

a charge storage means coupled to said first and second current means for accumulating a charge proportional to the difference in magnitude and duration of the difference in magnitude between said first and second currents; and

means coupling said charge storage means to said voltage controllable tuner for controlling the tuning of said tuner in accordance with said charge on said charge storage means.

3,958,181
DISTURBANCE SIGNAL DETECTOR FOR BLANKING CIRCUIT CONTROL

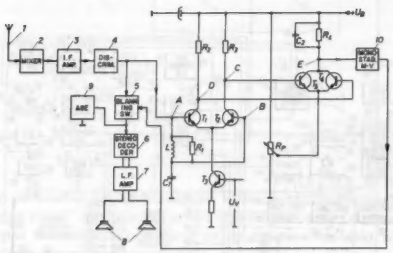
Jens Hansen, Hildesheim, and Willy Minner, Schwaigern, both of Germany, assignors to Blaupunkt-Werke GmbH, Hildesheim, Germany

Filed May 6, 1975, Ser. No. 575,080

Claims priority, application Germany, May 20, 1974, 2424450

Int. Cl.² H04B *1/12*

U.S. Cl. 325—480 **7 Claims**



1. Disturbance signal detecting circuit for receiver blanking control, comprising:

a frequency sensitive network responsive to disturbance signals in a frequency region outside a usable signal channel and capable of modifying the amplitude of signal components in said off-channel frequency region;

a symmetrically constituted differential amplifier (T_1,T_2) having at least one differentially connected pair of semiconductor devices and having first and second differential inputs connected respectively to control electrodes of said semiconductor devices, differential outputs connected to output electrodes of said devices and a common mode electrode connection, said first input being connected to the input signal connection of said network (L,C_1,R_1) and said second input being connected to an output connection of said network;

a transistor circuit comprising two transistors (T_4,T_5) having common connections at both ends of the switching paths of the transistors and provided with a bias in the blocking direction, said outputs of said differential amplifier being respectively connected to the electrically separate control electrodes of said transistor circuit, and

means for providing receiver control pulses from one of said common connections of said transistor circuit (T_4,T_5) suitable for control of a blanking switch in a receiver arranged to respond to signals in said usable channel.

3,958,182
ELECTRONIC CIRCUIT FOR SUPPLYING ENERGIZING PULSES OF PREDETERMINED DURATION TO AN ELECTRIC MOTOR

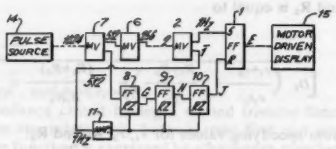
Pierre Sauthier, Brugg, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Switzerland

Filed Sept. 11, 1974, Ser. No. 504,890

Claims priority, application Switzerland, Oct. 4, 1973, 14192/73

Int. Cl.² H03K *5/04*, *21/32*; G05B *19/40*

U.S. Cl. 328—58 **8 Claims**



1. An electronic circuit for generating pulses of predetermined duration, said circuit comprising:

a principal chain of frequency dividing elements;

an auxiliary chain of frequency dividing elements;

means for driving both said principal chain and said auxiliary chain from a common source of pulses for simultaneous operation of both said principal and auxiliary chains;

a bistable multivibrator responsive to pulses at first and second inputs for assuming first and second stable states to thereby produce said pulses of predetermined duration;

means connecting said principal chain to one input of said bistable multivibrator; and,

means connecting said auxiliary chain to the second input of said bistable multivibrator,

said means for driving both said principal chain and said auxiliary chain including a pulse source connected to the input of said principal chain of frequency dividing elements, and means connecting an output of an intermediate element of said principal chain of elements to the input of said auxiliary chain of frequency dividing elements.

3,958,183
FREQUENCY SELECTIVE SIGNAL PRESENCE DETECTOR

Dietrich H. Schaefer, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 13, 1975, Ser. No. 549,587

Int. Cl.² H03D *3/02*

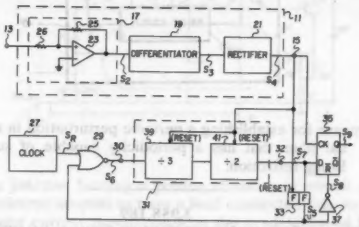
U.S. Cl. 328—138 **14 Claims**

1. A signal presence detector selective over at least a frequency range of a first frequency F_L to a second frequency F_H where $F_H \geqq F_L$, said signal presence detector comprising:

a. first means comprising means responsive to amplitude variations in an input signal for developing a timing signal comprising a series of timing indications whose occurrences are dependent at least upon the amplitude of the input signal such that for a sinusoidal input signal of frequency F_X the frequency of said timing signal is CF_X where C is a predetermined scale factor;

b. second means comprising means for generating a periodic clock signal comprising a series of clock indications; and

c. third means comprising means responsive to said timing indications and said clock indications for (i) providing a time window following and associated with each timing indication, each of said time windows, as measured in



time from its associated one of said timing indications, opening no later than T_H/C and closing no earlier than T_L/C, where T_H and T_L are respectively equal to $1/F_H$ and $1/F_L$, and (ii) detecting time coincidence between a first time window and a second timing indication, said first time window being associated with a first timing indication and said second timing indication comprising the timing indication succeeding said first timing indication.

3,958,184

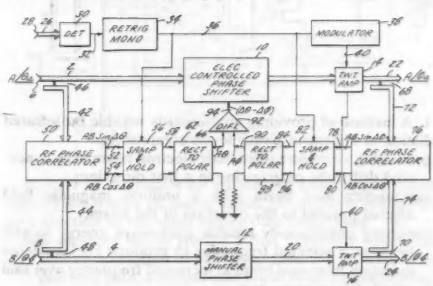
TRAVELING WAVE TUBE PHASE CORRECTION LOOP

George F. Bock, Santa Ana, Calif., and Richard J. Pankow, Norwalk, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed June 2, 1975, Ser. No. 583,082

Int. Cl.² H03B *3/04;* **H03K** *5/18*

U.S. Cl. 328—155 **4 Claims**



1. Apparatus for correcting phase errors introduced in RF signal channels, comprising:

a plurality of RF signal channels, each of said signal channels including a traveling wave tube amplifier;

a plurality of phase difference detecting means, there being a pair of said phase difference detecting means for each of said plurality of channels except a first one of said channels, one of said phase difference detecting means in each pair being interposed between said first channel and a related one of said plurality of channels at the input side of the corresponding traveling wave tube amplifiers and one of said pair being interposed between the related one of said channels and said first channel at the output side of the corresponding traveling wave tube amplifiers, each of said phase difference detecting means providing a signal manifestation of the difference in phase between the related channels at the input and output sides, respectively, of the related traveling wave tube amplifiers; and

means responsive to said phase difference signals of a related pair for introducing a phase shift in series with the traveling wave tube amplifier in the one of the related channels other than said first channel.

3,958,185

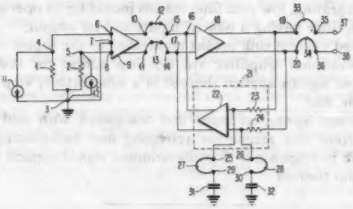
LOW NOISE AMPLIFIER

Joseph Charles Hartung, Round Rock, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 26, 1975, Ser. No. 590,660

Int. Cl.² H03F *1/26*

U.S. Cl. 330—149 **9 Claims**



1. An amplification system comprising:

a first amplifier having an input and an output;

feedback means connecting said output to said input for reduction of D.C. offset of an output signal of said first amplifier, said feedback means introducing external noise into said input; and

noise cancellation means connected to said input for cancelling noise introduced by said feedback means by introduction into said input of additional noise of equal magnitude and opposite polarity.

3,958,186

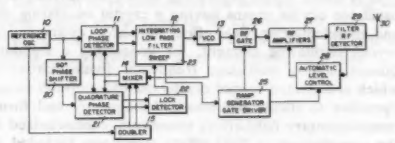
WIDEBAND PHASE LOCKED LOOP TRANSMITTER SYSTEM

James Edward Jesse, Oakland; James V. Motsinger, Plantation; George Revtai, Jr., Hollywood, and Jose Suarez, Miami, all of Fla., assignors to Motorola, Inc., Chicago, Ill.

Filed Mar. 10, 1975, Ser. No. 556,617

Int. Cl.² H03B *3/04*

U.S. Cl. 331—4 **8 Claims**



1. A phase locked loop comprising:

a. a reference oscillator providing an output signal having a fixed predetermined frequency;

b. a loop phase detector having a first input connected to receive the output signal of said reference oscillator, a second input and an output;

c. an integrating low pass filter including an operational amplifier having a pair of inputs connected to the output of said loop phase detector and an output;

d. sweep signal producing means including fixed current sink means connected alternately to each of said inputs of said operational amplifier during unlock conditions of the phase locked loop and disconnected during lock conditions for providing a substantially linear ramp voltage at the output of said low pass filter when said sweep signal producing means is activated;

e. a voltage controlled oscillator having a control input for controlling the operating frequency thereof connected to the output of said integrating low pass filter and an output having a signal of a predetermined frequency thereon;

f. a mixer having a first input connected to the output of said voltage controlled oscillator, a second input and an output connected to the second input of said loop phase detector; and

g. signal providing means connected to the second input of said mixer for supplying a signal thereto having a frequency separated from the frequency of the output signal of said voltage controlled oscillator by the frequency of the output signal of said reference oscillator.

7. A sweep signal producing circuit for a phase locked loop comprising:

a. integrating, low pass filter means including an operational amplifier having a pair of inputs and an output;

b. fixed current sink means connected to the inputs of said operational amplifier via flip-flop action for reducing input signals applied thereto in a substantially step function; and

c. means having an input and associated with said fixed current sink means for activating and deactivating said sink in response to a predetermined signal applied to the input thereof.

3,958,187

CLOCK SIGNAL GENERATING DEVICE WITH COMPLEMENTARY MOS TRANSISTORS

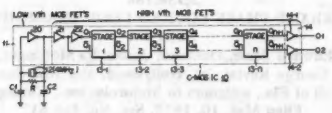
Yasoji Suzuki, Ayase, and Teruaki Tanaka, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 19, 1975, Ser. No. 578,985

Claims priority, application Japan, May 20, 1974, 49-55360

Int. Cl.² H03B 5/36; H03K 23/30

U.S. Cl. 331—74 **4 Claims**



1. A clock signal generating device comprising a crystal oscillator circuit means having a crystal oscillating element and complementary field effect transistors connected to said crystal oscillating element, for generating a standard frequency, and a multistage frequency divider circuit means which is conected to said crystal oscillator circuit means and operative to divide the standard frequency and formed of complementary field effect transistors, characterized in that the complementary field effect transistors included in said clock signal generating device which are adapted for high frequency operation have a lower threshold voltage than those adapted for low frequency operation.

3,958,188

FIBER DISTRIBUTED FEEDBACK LASER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Charles Elachi, Pasadena, Calif.; Gary A. Evans, Pasadena, Calif., and Cavour Yeh, Pasadena, Calif.

Filed Dec. 11, 1974, Ser. No. 531,565

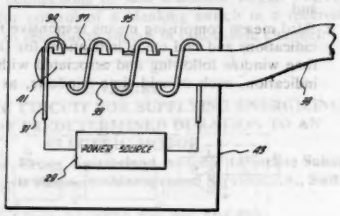
Int. Cl.² H01S 3/082

U.S. Cl. 331—94.5 C **36 Claims**

1. A laser mechanism comprising:

an optical fiber having an active material diffused therein;

pumping means for exciting the atoms in said active material; and



means for establishing a periodic perturbation in said optical fiber that has a periodicity capable of supporting Bragg reflection.

3,958,189

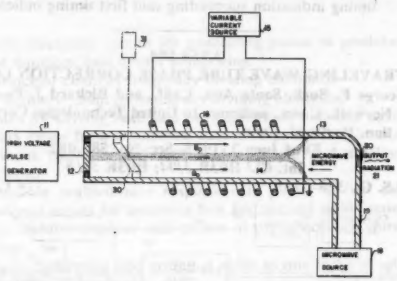
STIMULATED COHERENT CYCLOTRON SCATTERING, MILLIMETER, AND SUBMILLIMETER WAVE GENERATOR

Phillip A. Sprangle, and Victor L. Granatstein, both of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 4, 1975, Ser. No. 583,729

Int. Cl.² H01S 3/09

U.S. Cl. 331—94.5 PE **10 Claims**



1. A method of providing continuously tunable far infrared radiation at enhanced power levels comprising:

generating an intense relativistic electron beam in an evacuated drift tube propagating in a first direction;

surrounding said beam with a uniform magnetic field aligned parallel to the direction of the beam;

supplying continuously tunable microwave energy to said beam at a selected frequency to produce backscattered radiation from said beam at increased frequency over said selected frequency; and

adjusting the magnitude of the magnetic field such that the electron cyclotron frequency is offset from the microwave frequency by such value as to optimize power level output of the scattered radiation through magnetic resonance effects.

3,958,190

LOW HARMONIC CRYSTAL OSCILLATOR

Morris L. Minch, Coral Springs, Fla., assignor to Motorola, Inc., Chicago, Ill.

Filed Mar. 31, 1975, Ser. No. 563,745

Int. Cl.² H03B 5/36; H03C 3/22

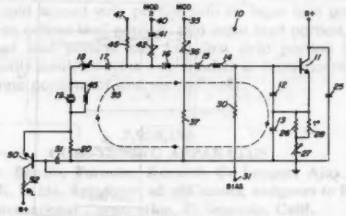
U.S. Cl. 331—116 R **1 Claim**

1. A low harmonic, crystal oscillator comprising:

a. an electronic tank circuit tuned to a predetermined frequency and including an inductance, a plurality of capacitors and a crystal;

b. a transistor connected to said tank circuit to form a colpitts type oscillator; and

c. a common base transistor circuit connected to operate in a linear range and including a transistor with an emitter-



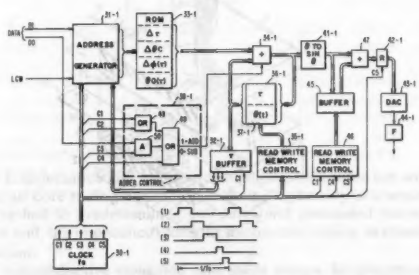
base junction forming a portion of said tank circuit and a collector adapted to have a load connected thereto for passing current therethrough at the predetermined frequency.

3,958,191

MULTI-LINE, MULTI-MODE MODULATOR USING BANDWIDTH REDUCTION FOR DIGITAL FSK AND DPSK MODULATION

Gardner D. Jones, Jr., Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1974, Ser. No. 525,699
Int. Cl.² H03C 3/02; H04L 27/20
U.S. Cl. 332—1 **18 Claims**



1. A DPSK modulator for modulating serial binary encoded data by generating an analog signal, the phase of which varies as a function of the serial binary data comprising:

first memory means storing a first numerical value representing a fraction of the baud time of the serial binary encoded data, a second numerical value corresponding to a phase increment of a carrier wave, and a group of *n* numerical values for each of the possible phase transitions for encoding the data on the carrier wave, each of said *n* numerical values representing a predetermined phase trajectory;

an adder having two inputs, one of which is connected to the output of said first memory means;

first and second registers, each having an input connected to the output of said adder and an output connected to the said other input of said adder;

a sampling clock means providing first, second and third clock pulses during mutually exclusive parts of each of said sampling periods;

first means responsive to said first register and said first clock pulse for providing signals corresponding too the contents of said first register during each sampling period;

control means responsive to said first, second and third clock pulses for connecting said first register between the output and input of said adder under control of said first clock pulse and said second register under control of the said second and third clock pulses;

adder control means responsive to said data signal and said clock signals for generating a control signal applied to said adder which causes said adder to perform an addition function under control of said first and said second clock pulses and a subtraction function under control of said third clock pulse when the sign value of the data signal is negative and addition function when the sign value of the data is positive;

an address control generator responsive to the data signals, the signals from said first means and said first, second and third clock signals for generating a first address signal during each sampling period under control of said first clock signal for accessing the said first numerical value from said memory for modifying the value stored in said first register as a function of the numerical value accessed and the status of the adder control means, for generating a second address signal during each sampling period under control of said second clock pulse for accessing the said second numerical value for modifying the value stored in the said second register as a function of the numerical value, and for generating a third address signal during each sampling period under control of said third clock pulse for accessing one of said n numerical values as a function of the signal to be modulated and the signal supplied by said first means for modifying the value stored in said second register as a function of the numerical value accessed and the output from said adder control means; and

second means responsive to the adder output under control of the said third clock pulse for converting the adder output to an analog signal.

9. A method for digitally generating narrow bandwidth DPSK modulated signals comprising the steps of:

storing a digital numerical value corresponding to a phase increment of a carrier wave and a predetermined trajectory for each of the possible phase transitions in the form of n discrete digital numerical values for each of the possible phase transitions;

for each data transition; selecting the stored value corresponding to the carrier wave, calculating the instantaneous phase in digital form and storing the calculated value, selecting one of the stored groups of n discrete numerical values as a function of the signal to be modulated and selecting from said group each of said n discrete numerical values at least once as a function of the inter-baud time, and algebraically accumulating as a function of the signal to be modulated the selected values and the stored digital phase value of the carrier wave; and

converting each such accumulated digital phase values to an analog signal having the same instantaneous phase.

3,958,192

DUAL SEPTUM WAVEGUIDE TRANSDUCER

James V. Rootsey, Sunnyvale, Calif., assignor to Aeronutronic Ford Corporation, Blue Bell, Pa.

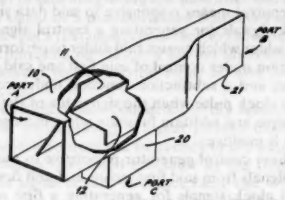
Filed Apr. 23, 1975, Ser. No. 570,606
Int. Cl.² H01P 1/16, 5/12
U.S. Cl. 333—9 **3 Claims**

1. A three-port waveguide transducer comprising:

a first section of waveguide capable of supporting transverse electric signal energy of any polarization and comprising a first port,

a pair of tapered septums located inside said first section of waveguide and extending from opposite walls thereof, said pair of septums being positioned to divide said first section of waveguide into three rectangular channels with the combined width of the outer two of said channels being equal to the width of the central channel,

means for coupling said central channel to a second transducer port, and



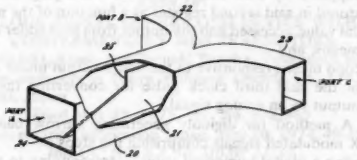
means for coupling said outer two channels to a third transducer port.

3,958,193

TAPERED SEPTUM WAVEGUIDE TRANSDUCER

James V. Rootsey, Sunnyvale, Calif., assignor to Aeronutronic Ford Corporation, Blue Bell, Pa.

Filed Apr. 23, 1975, Ser. No. 570,604
Int. Cl.[2] H01P 1/16, 5/12
U.S. Cl. 333—9 **8 Claims**



1. A transducer comprising:

a first waveguide capable of supporting propagation of transverse electric signals of any polarization, and

a septum dividing said first waveguide into a pair of waveguides each of which can support transverse electric signals of only one polarization, said septum having a tapered portion extending from a point on one wall of said first waveguide to a point closer to but spaced from the opposite wall of said first waveguide and a transverse portion extending across a part of said first waveguide from said tapered portion to said opposite wall, said taper being angled to optimize the transfer of electrical energy between said first waveguide and said pair of waveguides, and said transverse portion first having a dimension that matches the series impedance of said pair of waveguides to the impedance of said first waveguide at the position of said transverse portion.

3,958,194

FREQUENCY-SENSITIVE ATTENUATOR

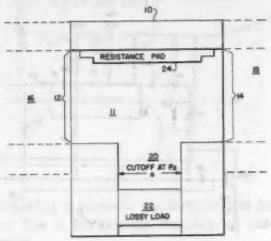
Gerald I. Klein, Baltimore, and Thomas E. Steigerwald, Simpsonville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 3, 1975, Ser. No. 538,634
Int. Cl.[2] H01P 1/22, 1/20
U.S. Cl. 333—81 B **6 Claims**

1. A frequency-sensitive attenuator for providing a controlled attenuation characteristic in a dominant-mode waveguide comprising:

a waveguide tee having a branch line, said branch line having its width set so that the cutoff frequency of said branch line is at the design frequency, said dominant-mode waveguide connected to opposite ends of the straight section of said waveguide tee for propagating energy to a load through said waveguide tee at said design frequency; and

lossy means terminating said branch line so that any energy propagating down said branch line at frequencies higher



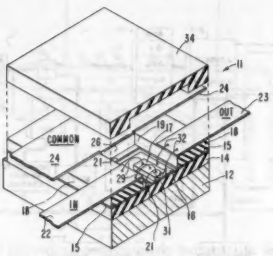
than said design frequency are absorbed according to a controlled attenuation characteristic, said characteristic obtained by adjusting the distance of said lossy means from the entrance of said branch line.

3,958,195

R.F. TRANSISTOR PACKAGE HAVING AN ISOLATED COMMON LEAD

Joseph H. Johnson, Sunnyvale, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Mar. 21, 1975, Ser. No. 560,674
Int. Cl.[2] H01L 23/12; H01P 1/00
U.S. Cl. 333—84 M **12 Claims**



1. In a radio frequency transistor package having an electrically isolated common lead structure:

an electrically insulative thermally conductive substrate structure;

an electrically conductive transistor mounting pad disposed overlaying said substrate structure in thermal energy exchanging relation therewith;

a first layer of electrically conductive material disposed overlaying said substrate structure, said first layer of conductive material being disposed around said mounting pad in electrically insulative relation thereto to form a ground plane region;

an electrically insulative spacer structure disposed overlaying said first layer of electrically conductive material, said insulative spacer structure having an aperture therein disposed in registration over said mounting pad, said aperture having sufficient cross-sectional dimensions to expose said mounting pad and at least a portion of an inside marginal lip of said ground plane region of said first layer of electrically conductive material; and

a second layer of electrically conductive material overlaying said spacer structure, said second layer of electrically conductive material having at least a gap therein separating said second layer into at least first and second strip

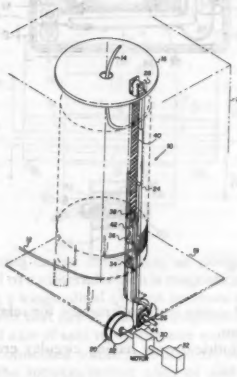
portions, said first strip portion defining a common lead portion extending over said spacer structure adjacent said aperture, said second strip portion extending over said spacer structure and intersecting with and being interrupted by said aperture to electrically insulatively separate said second strip portion into an input lead portion and an output lead portion, said input lead portion, said output lead portion and said first strip portion being mutually insulated from one another to form electrically discrete portions of said second layer.

3,958,196

COIL TUNING APPARATUS

James D. Benzie, Toronto; Kenneth C. Lepper, Ajax, and Leslie K. Iwata, Agincourt, all of Canada, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 20, 1975, Ser. No. 551,469
Int. Cl.² H03J *3/20*
U.S. Cl. 334—71 **6 Claims**



1. Inductance coil impedance changing means for use with an air core radio frequency coil having a plurality of contacts attached to predetermined coil turns and positioned interior the coil, the impedance changing means comprising, in combination:

nonconductive elongated tape guide means, for placement interior an inductive coil;

flexible tape means having first and second ends and including a conductive portion;

tape supply means for dispensing said flexible tape means in said tape guide means whereby the conductive portion of said flexible tape means extends a known distance along the length of said tape guide means;

means for attaching said tape supply means to one end of said flexible tape means; and

tape take-up means, connected to the other end of said flexible tape for retrieving slack in said flexible tape means as it is dispensed by said tape supply means.

3,958,197

HIGH INTERRUPTING CAPACITY GROUND FAULT CIRCUIT BREAKER

Carl E. Gryctko, Haddon Heights, N.J., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Jan. 24, 1975, Ser. No. 543,864
Int. Cl.² H01H *83/00, 83/02*
U.S. Cl. 335—18 **6 Claims**

1. Protective apparatus for connection in series between a source of electrical energy and an external power utilization device to automatically interrupt current flow therebetween upon the occurrence of predetermined fault conditions;

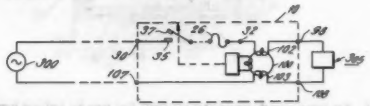
said apparatus including the series combination of a circuit breaker, a current limiting fuse device, and ground fault interruption means;

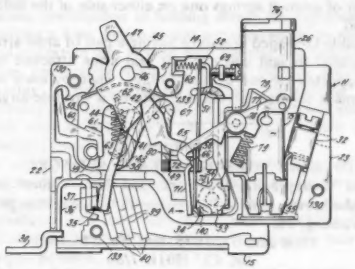
said current breaker including a pair of cooperating contacts, manually operable first means for moving said contacts between their engaged and disengaged positions, and an elongated bimetallic member having a first end including pivot means and a second end having a contact tip;

said elongated member including second means directly coupled to said first means for automatically moving said contacts to their disengaged position in response to predetermined overcurrent fault conditions causing rotation of said elongated member about said pivot means;

third means directly coupled to said elongated member for automatically moving said contacts to their disengaged position responsive to initiating disconnection of said fuse device from said circuit breaker;

said circuit breaker having a predetermined interruption characteristic in a maximum permissible rated interruption current value at a rated voltage value to define its maximum kva. capacity, said rated interruption current value being less than the maximum current available from the source;





said current limiting fuse device having a predetermined current interruption value and a rated voltage value;

said interruption characteristics of said circuit breaker and current limiting fuse device being predeterminately coordinated such that the rated voltage values of said fuse device and said circuit breaker are each significantly less than the voltage of said source; and

said predetermined fuse interrupting current value is significantly less than said circuit breaker rated interrruption current, thereby to prevent the subjection of said circuit breaker to an interruption current in excess of said predetermined fuse interrupting value, at said voltage of said source;

said ground fault interruption means including an actuatable member and fourth means for detecting a ground fault condition, said actuatable member being energized by said fourth means in response to ground fault conditions in excess of a predetermined value;

said actuatable member being actuated directly against said contact tip to rotate said elongated member about said pivot means to operate said second means and automatically cause said contacts to move to their disengaged position, thereby interrupting current flow to said power

utilization device in the event of said ground fault conditions.

3,958,198

MAGNETO SYSTEM INCLUDING A TILTABLE U-SHAPED ARMATURE

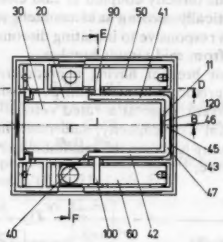
Werner Minks, Kleingeschaidt, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 15, 1974, Ser. No. 524,099

Claims priority, application Germany, Nov. 19, 1973, 2357575

Int. Cl.² H01H 67/02

U.S. Cl. 335—128 4 Claims



1. An improved magneto system for use in relays employing a housing, a yoke member, a field coil, and a tilting U-shaped armature partially surrounding the coil so that the armature is capable of tilting both in the plane of the arms of the armature as well as in the plane of the front plate of the armature, wherein the improvement comprises:

a pair of contact springs one on either side of the field coil; and

a tiltable U-shaped armature having a pair of arms arranged parallel to said coil each of said arms attached to and supported by one of said springs, whereby each of said arms is separated from the yoke by a variable airgap.

3,958,199

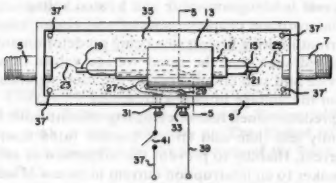
HIGH VOLTAGE RELAY PACKAGE

Michael Wesley Seitz, Jr., York, and John Gilbert Berger, Elizabethtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 31, 1975, Ser. No. 546,158

Int. Cl.² H01H 1/66

U.S. Cl. 335—154 4 Claims



1. A high voltage relay comprising:

an electrically insulating housing,

a reed switch positioned within said housing and having terminals coupled through said housing,

an electrically insulating material surrounding said reed switch within said housing and bonded to said reed switch and said housing,

low voltage means for operating said reed switch,

an electrically insulating tube surrounding said reed switch,

a coil form surrounding said tubing and a coil which is a part of said low voltage means formed on said coil form, said electrically conductive insulating material extending into the space between said reed switch and said tube and the space between said tube and said coil form and bonded to said tube, said coil form and said coil.

3,958,200

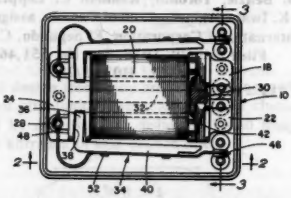
BLADE CONSTRUCTION FOR RELAY

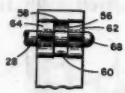
Frank X. Mally, Crystal Lake, Ill., assignor to Guardian Electric Manufacturing Company, Chicago, Ill.

Filed Jan. 9, 1975, Ser. No. 539,772

Int. Cl.² H01H 50/28

U.S. Cl. 335—275 3 Claims





1. An improved spring leaf construction for relays comprising, in combination:

a generally cylindrical post having circular cross section; and

a cantilever blade having a contact end and a post connection end, said post connection end including a continuous, planar section with first and second parallel slits extending substantially in the direction of the longitudinal axis of the blade, said slits defining an intermediate portion and flanking side portions, said intermediate portion extending transversely from said side portions to define an opening encircling the post and edges scarifying said post, whereby said blade is retained in substantially nonrotatable position on said post to provide a spring leaf.

3,958,201

INTERLACED DISC COIL WINDING HAVING OFFSET CROSS-CONNECTIONS

Mahlon L. Henderson, Campinas, Brazil, assignor to General Electric Company

Filed Nov. 29, 1974, Ser. No. 527,960

Int. Cl.² H01F 15/14

U.S. Cl. 336—70 6 Claims

1. In an inductive winding for electrical apparatus of the type having a plurality of coaxially disposed disc-wound annular coils, said coils being arranged into at least two serially

connected winding sections, each winding section having at least two of said disc-wound annular coils spirally wound together in a re-entrant series interlaced relation, cross-connections between coils in a winding section being made in a region adjacent the coils of said winding section extending a limited distance circumferentially of the winding, the improvement comprising:

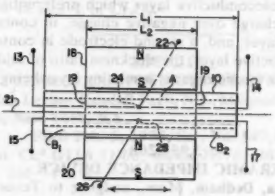
that a cross-connection at the internal surface of a winding section is offset circumferentially of said inductive winding a substantial distance from a cross-connection at the internal surface of an adjacent winding section.

3,958,202

POSITIONAL TRANSDUCER UTILIZING MAGNETIC ELEMENTS HAVING IMPROVED OPERATING CHARACTERISTICS

Edward F. Sidor, Lombard, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 18, 1974, Ser. No. 524,608
Int. Cl.² G08C *19/06*; H01F *21/06*
U.S. Cl. 336—110 **10 Claims**



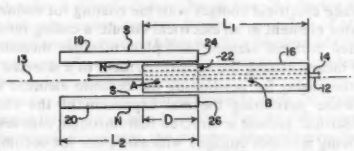
1. A sensing device comprising an elongated, hollow tube constructed of a material which is magnetically saturable, said tube having a longitudinal axis, an aperture in said tube, a pair of sense wires that run in a direction generally parallel to the longitudinal axis of said tube with one end of each sense wire being interconnected within said tube, an electrical lead connected to the interconnected ends of said sense wires that passes through said aperture and elongated permanent magnet means constructed to completely magnetically saturate a portion of said tube which is disposed adjacent said magnet means and to be substantially ineffective in magnetically saturating the remaining portion of said tube so that the total volume of said tube which is completely magnetically saturated varies in a controlled manner as a function of the position of said magnet means relative to said tube.

3,958,203

POSITIONAL TRANSDUCER UTILIZING MAGNETIC ELEMENTS

Victor M. Bernin, Mount Prospect, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation of Ser. No. 518,310, Oct. 29, 1974, abandoned. This application Sept. 15, 1975, Ser. No. 613,156
Int. Cl.² H01F *21/00*; G08C *19/06*
U.S. Cl. 336—110 **6 Claims**



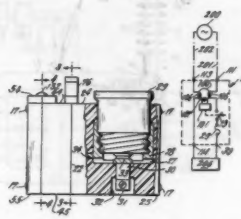
1. A sensing device comprising a cylindrical, elongated, hollow tube having an elongated axis and constructed of material which is magnetically saturable, at least one sense wire that passes through said tube in a direction substantially parallel to the elongated axis of said tube and a pair of opposite magnetic poles diametrically opposed adjacent the outer periphery of said tube which completely magnetically saturate the portion of said tube which is disposed intermediate said magnetic poles but which are substantially ineffective in magnetically saturating the remaining portion of said tube.

3,958,204

FUSED GFI UNIT

Carl E. Gryctko, Haddon Heights, N.J., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Jan. 27, 1975, Ser. No. 544,191
Int. Cl.² H01H *83/20*, *71/40*
U.S. Cl. 337—6 **5 Claims**



1. A unitary fused ground fault circuit interrupting device constituting a protective arrangement for automatically interrupting a flow of current from a source of electrical energy to an external power utilization device upon the occurrence of predetermined fault conditions; said protective arrangement including:

a series combination of holding means for replaceably receiving a fuse, switch means actuated solely by mechanical operation and ground fault interruption means;

a fuse operatively mounted by said holding means and having a predetermined current interruption value, thereby to interrupt a flow of current from said source to said utilization device in the event of a current flow in excess of said interruption value;

said switch means including a pair of cooperating separable contacts, manually operable latchable means for moving said contacts between their engaged and disengaged positions, said latchable means when mechanically unlatched automatically moving said contacts to their disengaged position;

said ground fault interruption means including differential means for detecting a ground fault condition and an actuatable member, said actuatable member being operatively positioned to mechanically unlatch said latchable means to automatically move said contacts to their disengaged position in response to the detection by said differential means of a predetermined ground fault condition.

3,958,205

OPEN LINK TOTAL RANGE FAULT INTERRUPTER

Lloyd Ronald Beard, and Allen Houpt Knepper, both of Centralia, Mo., assignors to A. B. Chance Company, Centralia, Mo.

Filed Dec. 23, 1974, Ser. No. 535,491
Int. Cl.² H01H *71/20*
U.S. Cl. 337—178 **15 Claims**

1. An open link fault interrupter adapted to be interposed in an electrical circuit in series between a pair of conductors and comprising:

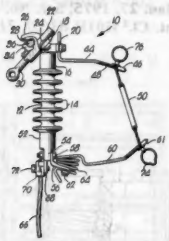
an elongated, insulative support;

mounting means on said support for gripping one of said conductors and suspending said interrupter from said one conductor in a depending relationship therefrom, the

gripping connection between said mounting means and one conductor serving as the sole support for said interrupter;

a first conductive fuse support arm extending from said support and adapted to be electrically connected to said one conductor when said interrupter is mounted thereon;

a second conductive fuse support arm spaced from said first arm and extending from said support, said second arm being adapted to be electrically connected to the other of



said conductor when said interrupter is interposed in said circuit;

an open link fusible element electrically interconnected between said first and second fuse support arms, said element being operable to sever upon experiencing a fault current of predetermined magnitude to thereby interrupt said current; and

means on said first and second arms for securing said fusible element therebetween.

3,958,206

CHEMICALLY AUGMENTED ELECTRICAL FUSE

Robert V. Klint, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 12, 1975, Ser. No. 586,286

Int. Cl.² H01H 37/76

U.S. Cl. 337—406 **10 Claims**

1. An electrical fuse for fast circuit interruption with low amounts of circuit-derived electrical energy at current levels above the steady-state current comprising

an elongated conductive fusible element having an exothermic reactive material carried by the central portion thereof,

mounting means connected to each end of said fusible element and supporting a surrounding insulating tube, and

a trigger circuit for initiating rapid circuit interruption comprising means for effectively sensing the current in said fusible element, and circuit means responsive to the sensing of a predetermined excessive current level for discharging supplementary electrical energy through a localized portion of said exothermic reactive material to initiate the exothermic reaction.

3,958,207

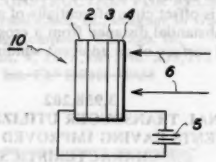
INJECTION CURRENT DEVICE AND METHOD

Simpei Tutihasi, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 17, 1974, Ser. No. 489,285

Int. Cl.² H01C 7/08

U.S. Cl. 338—15 **13 Claims**



1. A gain photocurrent device comprising, in turn, a first electrode comprising material having a work function greater than about 4 eV; an organic insulating layer having an ionization potential below about 8 eV, in contact with said first electrode; a photoconductive layer which preferentially conducts positive charge over negative charge, in contact with said insulating layer; and, a second electrode in contact with said photoconductive layer; the thickness ratio of said photoconductive layer to said organic insulating layer being at least about 10 to 1.

3,958,208

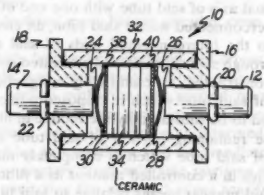
CERAMIC IMPEDANCE DEVICE

Robert F. Blaha, Dedham, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 5, 1974, Ser. No. 476,636

Int. Cl.² H01C 7/10, 1/016

U.S. Cl. 338—22 R **5 Claims**



1. An electrical resistor device comprising at least one thermally expandable resistor element of a ceramic material having a positive temperature coefficient of resistivity adapted to be heated to an elevated temperature when electrical current is directed through the element, a thin electrically conductive metallic coating adherent to the ceramic material along at least one surface of the ceramic element providing a low contact resistance surface for making low resistance electrical contact to the ceramic resistor element, an electrically conductive metal plate member in engagement with the coating to make electrical contact with the coating for connecting the resistor element in an electrical circuit, a casing receiving the coated ceramic element and plate member therein, and resilient means biasing the resistor element to a selected position in the casing for positioning the ceramic element in the casing while permitting thermal expansion of the element when electrical current is directed therethrough, said resilient means being movably engaged with said plate for accomplishing said positioning of the resistor element and for retaining the plate in electrical contact with said coating during such thermal expansion of the ceramic element while protecting the integrity of the coating during such thermal expansion.

3,958,209

HIGH TEMPERATURE THERMISTOR

Kazuya Soda, Takahama, and Naoto Miwa, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Japan

Filed Feb. 4, 1975, Ser. No. 547,095
Claims priority, application Japan, Feb. 28, 1974, 49-24670
Int. Cl.² H01C 7/04
U.S. Cl. 338—22 R 7 Claims

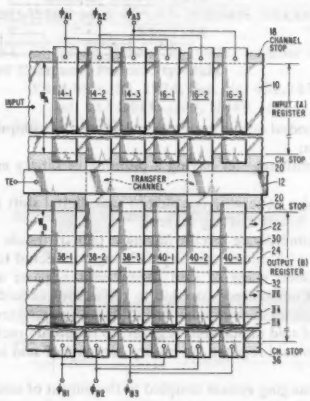
1. In a high temperature thermistor comprising a heat resisting resistor having a negative resistance-temperature characteristic and two electrodes connected to said heat resisting resistor, the improvement in that said heat resisting resistor comprises a mixture of Al_2O_3 and Cr_2O_3, the proportion of Al_2O_3 and Cr_2O_3 in the mixture being 89 – 6 mol % of Al_2O_3 and 11 – 94 mol % of Cr_2O_3.

3,958,210

CHARGE COUPLED DEVICE SYSTEMS

Peter Alan Levine, Kendall Park, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 5, 1975, Ser. No. 547,129
Int. Cl.² G11B 11/08; H01L 29/78; H03K 3/353
U.S. Cl. 340—173 R 8 Claims



1. In combination:

an input linear array having a plurality of stages, each capable of storing a given amount of charge, each stage for storing an analog charge signal;

a plurality *n* of conversion charge coupled device registers, each conversion register having a plurality of at least *m* stages and each stage having only a fraction of the storage capacity of a stage of said input linear array, where *n* and *m* are integers greater than 1;

means for flowing the charge signal in each *j*'th stage of said input linear array into from 0 to *n* of the *j*'th stages of said conversion registers, the number depending on the amplitude of the charge signal present in the *j*'th stage of the input linear array, where *j* is an integer equal to 1, 2 - - - *m*, *m* being not greater than the total number of stages in the input linear array;

means for concurrently shifting the charge signals in said *n* conversion registers down said registers; and

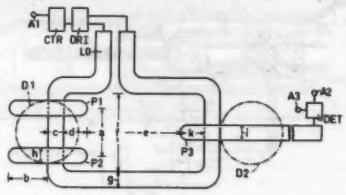
means for reading, in parallel, each group of charge signals reaching the output stage of said *n* conversion registers.

3,958,211

GENERATOR FOR MAGNETIC DOMAINS

Taap van Suchtelen, and Gerrit Frens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 4, 1974, Ser. No. 529,364
Claims priority, application Netherlands, Dec. 20, 1973, 7317437
Int. Cl.² G11C 11/14
U.S. Cl. 340—174 TF 7 Claims



1. A device for generating magnetic bubbles in a plate or magnetic material which is situated in a principal magnetic field directed transverse to the plate, comprising a loop conductor having an inner side and an outer side, at least one first and at least one second preferred structure for bubbles which extend within the loop conductor, and current pulse generator means having output means which are connected to connections of the loop conductor, said generator means producing a first current pulse in the loop conductor whereby the principal magnetic field inside the said loop conductor is attenuated and a bubble present on one of the said preferred structures inside the loop conductor expands as far as one of said preferred structures and, after the termination of the said attenuation, is split into split-off bubbles which are present on at least two of said preferred structures, after which a split-off bubble is discharged, said generator means also producing, after the first current pulse has been generated, an oppositely directed second current pulse in the loop conductor, whereby the principal magnetic field inside the loop conductor is intensified, under the control of which bubbles are split off and driven out on parts of said first and second preferred structures which extend outside the loop conductor, at least one of the split-off bubbles, after termination of the second current pulse, being at least partly situated inside the loop conductor at a preferred position on said first preferred structure, and at least one of the said split-off bubbles being positioned at a preferred position on said second structure which is completely situated outside the loop conductor.

3,958,212

POWER FAILURE WARNING SYSTEM

Henry H. Henthorne, Marysville, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 24, 1975, Ser. No. 561,363
Int. Cl.² G08B 21/00
U.S. Cl. 340—253 C 1 Claim

1. A power failure warning system for warning of the failure of power in a commercial power system having a wall outlet connected to two electrical conductors of said system and energizing an electrical appliance via said wall outlet and a pair of electrical conductors of the appliance and a plug connected thereto, said warning system comprising

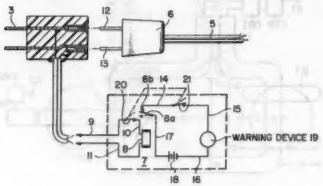
a first housing of electrically insulative material having a pair of spaced substantially parallel electrical conductors extending therethrough, said conductors extending as prongs from one end of the first housing and having sockets provided thereat at the opposite end of the first housing, said prongs being insertable in a commercial power outlet and the plug of the appliance being insertable in the sockets of the first housing:

an electrical relay in a second housing having an energizing winding and electrical relay contacts controlled in position by said winding;

a source of electrical energy in the second housing;

a warning device in the second housing;

an energizing circuit electrically connecting the energizing winding of the relay to one of the conductors of the power system and one of the conductors of the appliance via the corresponding conductor of the first housing and to the



other conductor of the appliance via the corresponding socket of the first housing for maintaining the winding energized during operation of the power system and the appliance;

a warning circuit in the second housing electrically connecting the source of electrical energy, the warning device and the relay contacts in circuit in a manner whereby when the power system is operating, the winding is energized, the contacts are separated and the warning device is inoperative, and when the power system fails, the appliance is inoperative, the winding is deenergized, the contacts are moved into electrical contact and the warning device is operated by the source of electrical energy; and

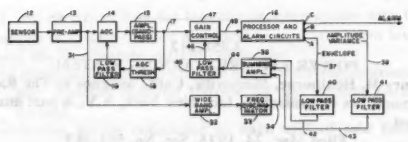
switch means in the second housing connected in the energizing and warning circuits for manually selectively activating and deactivating the warning system.

3,958,213

ADAPTIVE GAIN CONTROL AND METHOD FOR SIGNAL PROCESSOR

Richard W. Scott, Cupertino, and Marvin D. Laymon, Milpitas, both of Calif., assignors to GTE Sylvania Incorporated, Mountain View, Calif.

Filed Jan. 3, 1975, Ser. No. 538,348
Int. Cl.² G08B *13/16*
U.S. Cl. 340—261 **13 Claims**



1. In a signal processing system having a sensor for producing a first electrical signal corresponding to the sensed condition at one site, an envelope detector responsive to said first signal for producing a second signal that is a measure of the instantaneous amplitude of the envelope of the signal, comparator means responsive to said second signal for producing a third signal that is a measure of the difference between the instantaneous amplitude of and the average value of said envelope, means responsive to said first signal for producing a fourth signal having an amplitude that is a measure of the frequency of said first signal, and circuit means responsive to said third signal for producing an alarm, the improvement of means for automatically controlling the gain of the processing system comprising

means for changing the gain of said signal processing system,

means for modifying said second, third and fourth signals to have predetermined weighted values, respectively, corresponding to ambient conditions at said one site, and

means for summing said modified second, third and fourth signals to produce a control signal,

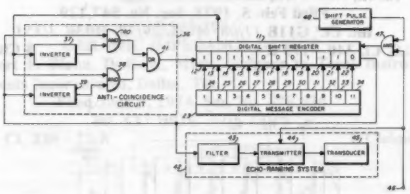
said control signal being applied to said gain changing means for automatically varying the gain of said system.

3,958,214

ENCODED ECHO-RANGING SIGNAL GENERATOR

Daniel E. Andrews, Jr.; William E. Klund, and Robert D. Isaak, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 19, 1963, Ser. No. 296,413
Int. Cl.² G01S *9/66*; H04K *1/00*
U.S. Cl. 340—3 A **20 Claims**



1. An encoded echo-ranging signal generator comprising in combination;

a digital shift register having a plurality of binary encoded stages,

a shift pulse generator coupled to said digital shift register for the timely shifting thereof,

an anti-coincidence circuit having a pair of inputs and an output with one of said inputs being connected to a predetermined stage of said digital shift register and the other input thereof coupled to the output of said digital shift register and with the output thereof connected to the input of said digital shift register, to randomly recirculate through said register the binary contents of said encoded stages,

an echo-ranging system coupled to the output of said digital shift register,

and a digital message encoder coupled to said digital shift register for the respective binary bit encoding of each stage thereof.

3,958,215

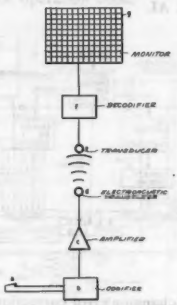
DEVICE FOR THE ACOUSTIC SUBMARINE TELETYPING

Ettore Bianco, San Donato Milanese, Italy, assignor to Snam Progetti S.p.A., San Donato Milanese, Italy

Filed Sept. 3, 1971, Ser. No. 177,759
Claims priority, application Italy, Sept. 3, 1970, 29297/70
Int. Cl.² H04B *11/00*
U.S. Cl. 340—5 R **3 Claims**

1. A device for underwater teletyping utilizing acoustical transmission comprising:

A. an electric signal generator actuated by a manually operated portable keyboard; having message characters thereon, said signal being generated in a predetermined code corresponding to the keyboard message characters;
B. an amplifier connected to the signal generating means to amplify the coded signal;



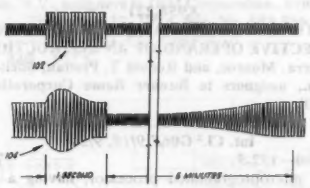
C. a transducer connected to the amplifier to transform the electrical signal to an acoustical signal; and
D. means for receiving the acoustical signal and converting said signal into readable form.

3,958,216

TWO-WIRE MULTIPLEX SEISMIC RECORDING SYSTEM

William L. Chapman, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Mar. 18, 1974, Ser. No. 451,747
Int. Cl.[2] G01V *1/00*; H04B *1/16*
U.S. Cl. 340—15.5 GC **10 Claims**



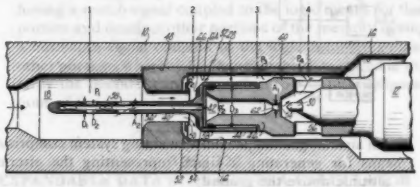
1. In a seismic signal receiving and recording system wherein a plurality of seismic signals received by geophones are modulated on respective ones of a plurality of different frequency carrier waves for frequency multiplex transmission along a two conductor line to a central recorder location, the improvement comprising:
amplifier means receiving said seismic signal input from said geophone for amplification and output to said modulator;
gain control means connected to control said amplifier means, said gain control means including a first resistance/capacitance combination having a fast time constant in response to increasing amplified signal level and including a second resistance/capacitance network having a very slow time constant in response to diminishing amplified signals thereby to provide adaptive gain setting of said amplifier means.

3,958,217

PILOT OPERATED MUD-PULSE VALVE

Ralph F. Spinnler, Glastonbury, Conn., assignor to Teleco Inc., Middletown, Conn.

Filed May 10, 1974, Ser. No. 468,643
Int. Cl. G01v *1/40*
U.S. Cl. 340—18 LD **5 Claims**

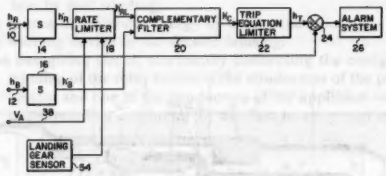


1. Telemetry apparatus for transmitting data to the surface during the drilling of a borehole by generating pressure pulses in a drilling fluid in a drill string, the apparatus comprising pilot operated valve means which includes:
primary valve means adapted for mounting in a drill string segment in which the drilling fluid flows, said primary valve means being movable between a first position corresponding to maximum flow of the drilling fluid and a second position restricting the flow of the drilling fluid;
an interior chamber in said primary valve;
said primary valve defining a piston, one side of said piston forming one wall of said interior chamber;
valve seat means for said primary valve means, said valve seat means and a face of said primary valve means cooperating to define a first variable flow orifice therebetween for flow of the drilling fluid from a drill string part upstream thereof to a drill string part downstream thereof;
delivery passage means from said first flow orifice for delivering drilling fluid downstream of the pilot operated valve means;
restriction means in said delivery passage means to establish a pressure drop in drilling fluid flowing past said restriction means;
probe means extending from said primary valve means in the direction to project into the part of the drill string upstream of said first variable flow orifice;
passage means in said probe means, said passage means being connected to said interior chamber and having inlet means for connecting to the upstream part of the drill string, whereby said interior chamber is in flow communication with the upstream part of the drill string;
discharge passage means from said interior chamber for connecting said interior chamber to said delivery passage means downstream of said restriction means, the flow area of said discharge passage means being greater than the flow area of said passage means in the probe means; and
second variable flow orifice means for varying the flow from said interior chamber to said delivery passage means downstream of said restriction means, said second variable flow orifice having pilot valve means variable between a first position corresponding to said first position of said position of said primary valve means and a second position corresponding to said second position on said primary valve means.

3,958,218
AIRCRAFT GROUND PROXIMITY WARNING SYSTEM WITH SPEED COMPENSATION

Charles Donald Bateman, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Continuation of Ser. No. 511,674, Oct. 3, 1974, abandoned. This application Aug. 20, 1975, Ser. No. 606,037
Int. Cl.[2] G01C 5/00
U.S. Cl. 340—27 R 7 Claims

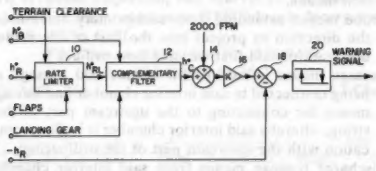


4. An aircraft ground proximity warning system comprising:
means for generating a signal representing the aircraft's altitude above the ground;
means for generating a signal representing the time rate of change of the aircraft with respect to the ground;
combining means for combining said aircraft altitude signal with said time rate of change signal to generate a combined signal;
warning means, responsive to said combined signal, for generating a warning signal when said combined signal exceeds a predefined reference value; and
speed compensating means, operatively connected to said combining means and responsive to a signal representing the aircraft's longitudinal velocity for effectively varying said reference value required to generate said warning signal as a function of aircraft longitudinal velocity in order to increase warning times at greater aircraft longitudinal velocities.

3,958,219
TERRAIN CLOSURE WARNING SYSTEM WITH ALTITUDE RATE SIGNAL CONDITIONING

Charles Donald Bateman, Bellevue, and Hans Rudolf Muller, Kirkland, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Division of Ser. No. 556,022, March 6, 1975, Pat. No. 3,934,221. This application July 18, 1975, Ser. No. 596,943
Int. Cl.[2] G01C 5/00
U.S. Cl. 340—27 R 24 Claims

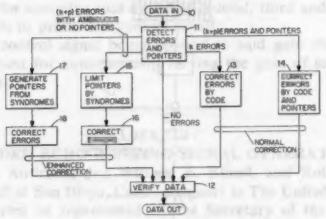


1. In an aircraft terrain warning system utilizing an altitude rate of change signal and an altitude above ground signal for generating a warning signal when the terrain closure rate exceeds a predetermined value as a function of altitude, wherein the improvement comprises:
means for limiting the maximum permitted value of the altitude rate of change signal; and
means, operatively connected to said limiting means and responsive to the altitude rate of change signal, for increasing the maximum permitted value of the altitude rate of change signal, as outputted by said limiting means, as a function of an increasing altitude rate of change signal, thereby effectively increasing warning times for greater rates of descent.

3,958,220
ENHANCED ERROR CORRECTION

John William Marshall, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 30, 1975, Ser. No. 582,516
Int. Cl.[2] G06F 11/12
U.S. Cl. 340—146.1 AL 12 Claims



1. The method of changing error correction apparatus operations for extending correction of data errors wherein the apparatus can correct k errors without auxiliary error location pointers and $k+p$ errors with auxiliary error location pointers, said apparatus generating plural sets of error-indicating syndrome signals, k and p being positive integers, means storing auxiliary error location pointer signals;
including the steps of:
matrix multiplying in said error correction apparatus one set of said syndrome signals until a predetermined relationship exists with another set of said syndrome signals;
during said multiplying, locating and correcting errors in data signals stored in said apparatus according to first error location criteria; and
upon detecting said predetermined relationship, locating and correcting data errors according to criteria other than said first error location criteria including using predetermined ones of said stored auxiliary error location pointer signals.

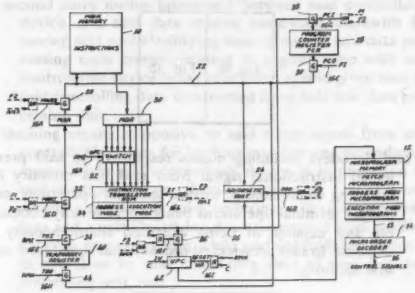
3,958,221
METHOD AND APPARATUS FOR LOCATING EFFECTIVE OPERAND OF AN INSTRUCTION

John J. Serra, Monroe, and Ronald T. Prodan, Shelton, both of Conn., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed June 7, 1973, Ser. No. 367,756
Int. Cl.[2] G06F 9/18, 9/20
U.S. Cl. 340—172.5 7 Claims

1. In a microprogrammed processor, having a memory storing a plurality of instructions, each instruction including an operation code, an address mode tag, and an operand, improved means responsive to the address mode tag of an instruction for initiating the execution of a selected address mode microprogram to locate the effective operand of the instruction, comprising:
a microprogram memory containing both address mode microprogram micro-orders for controlling the obtaining of the effective operand for an instruction in each of the address modes from the instruction operand, and an operation code micro-program for each operation code for controlling the execution of the instruction;
means for controlling the sequential reading out of micro-orders of each microprogram from said microprogram memory, said means including a microprogram register for addressing said microprogram memory;
decoder means operative in response to the address mode tag of an instruction for generating the address of an entry

point of a corresponding address mode microprogram in said microprogram memory for use to control the obtaining of the effective operand for the address mode indicated by the tag, said decoder means also being operative in response to the operation code of an instruction for generating the starting address of a corresponding operation code microprogram in said microprogram memory for controlling the execution of the operation indicated by instruction operation code;



means operative for each instruction for applying the address mode tag of the instruction to said decoder means and for then applying the operation code of the instruction to the decoder means;

means for applying the address mode microprogram entry point address read out from said decoder means in response to said tag to said microprogram register;

a temporary register; and

means for storing the operation code microprogram starting address read out from said decoder means in response to said operation code in said temporary register.

3,958,222

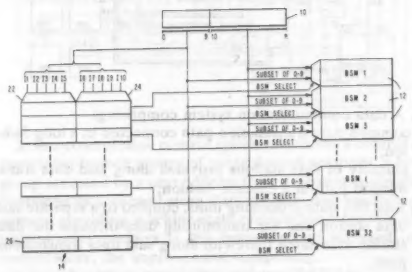
RECONFIGURABLE DECODING SCHEME FOR MEMORY ADDRESS SIGNALS THAT USES AN ASSOCIATIVE MEMORY TABLE

Benedicto U. Messina, and Arnold Weinberger, both of Poughkeepsie, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed June 27, 1974, Ser. No. 483,866

Int. Cl.² G06F 9/10

U.S. Cl. 340—172.5 **5 Claims**



1. In a memory system including a plurality of distinct memory portions in which the amount of storage can be changed by the addition or removal of portions of memory from the memory system, a decoder for selecting a memory address within one of the portions of the memory, comprising:

a word oriented array;

addressing means for accessing one bit of each word in the array in response to a number of address bits k but not all of the address bits n for an address in the memory system;

read and write means for storing and changing the data stored in the array so that the output on the word lines in the array can be selected to produce either a match or mismatch signal on each of the work lines of the array in response to an access of the array by the number of bits of the address;

logic circuit means for coupling remaining bits n-k of the address to each of said portions in the memory to select part but not all of the data stored in that portion; and

means coupling the word oriented array to the logic means for transmitting match and mismatch signals of each word line of the array to the logic means for one of said portions of the memory to select those portions of memory having a match signal coupled to the logic means for that portion and deselect other portions of the memory having a mismatch signal coupled to the logic means for those other portions whereby by changing the data stored in the array the docoder can be matched to various configurations of the memory system.

3,958,223

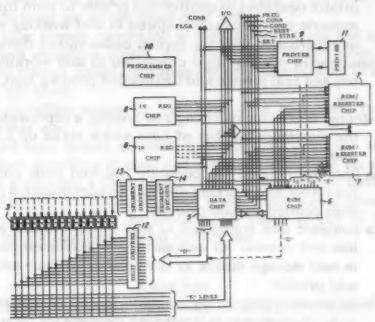
EXPANDABLE DATA STORAGE IN A CALCULATOR SYSTEM

Michael J. Cochran, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 368,901, June 11, 1973. This application July 28, 1975, Ser. No. 599,737

Int. Cl.² G06F 7/00

U.S. Cl. 340—172.5 **8 Claims**



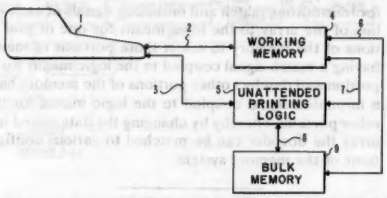
8. A data processing system of the type implemented on a plurality of semiconductor chips, one chip of said plurality of semiconductor chips having first data memory means addressable to provide a first plurality of multidigit data locations, means for entering multibit data words into said first data memory, and controlled means for outputting said multibit data words from said first data memory, a second chip of said plurality of chips comprising a second data memory means addressable to provide a second plurality of data locations and having means therein and controlled for entering the multibit data words and for outputting the data words therefrom for communication to the first data memory means, terminal means on said second chip for externally defining a code thereon uniquely identifying said second data memory, and means on said second chip and coupled to said means for outputting of said first chip for comparing a selected digit of a received multibit word with the code on said terminal means and upon equal comparison selecting and enabling only said second chip for communicating data between the first and second plurality of multidigit data locations, over the same channel as the multibit data words.

3,958,224

SYSTEM FOR UNATTENDED PRINTING

William Weller Boyd; Wayne Finis Rogers, and James Wilson Toups, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,273
Int. Cl.² G06F 3/10
U.S. Cl. 340—172.5 18 Claims



1. An unattended printing system for printing individual records on sheets of paper or other suitable media comprising:

a printer;

a bulk storage means containing said individual records including format code characters and alphanumeric code characters to be printed on said media;

a sequential addressable working memory interfaced with said bulk storage means for receiving said format code characters and said alphanumeric code characteers of each individual record to be printed by said printer;

control means connected to said working memory and said printer operative to control said printer to print the alphanumeric code characters stored in said working memory in accordance with the format codes stored therein;

unattended printing logic connected to said working memory and said printer said unattended printing logic including,

storage means for receiving and holding a representation of the maximum number of lines which make up a page of said media;

a line end counter for counting line end code characters read from said working memory to accumulate a count of lines printed by said printer;

a compare unit connected to said storage means and said line end counter for comparing the maximum line count in said storage means to the number of lines printed by said printer;

logic means operative in response to end of alphanumeric code characters in said working memory for clearing said working memory of said format and alphanumeric code characters; and

indexing means operative in response to the end of alphanumeric code characters in said working memory for outputting indexing pulses to said printer and said line end counter to cause said printer to advance the page of said media being printed upon out of printing association with said printer and advance a subsequent page into said printer until an equal compare output is indicated by said compare unit.

3,958,225

APPARATUS AND METHOD FOR CONTROLLING A COMMUNICATIONS TERMINAL

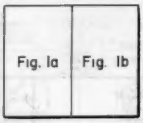
Kenneth W. Turner, Des Plaines, and George C. Zobel, Palatine, both of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed Jan. 28, 1974, Ser. No. 437,257
Int. Cl.² G06F 3/14
U.S. Cl. 340—172.5 21 Claims

1. An improved control circuit for a communications terminal of the type having a first selectively addressable memory providing a plurality of sequential predetermined instructional signals serving to initiate a selected operational sequence of the terminal; wherein the improvement comprises:

at least two decoders each of which can be selectively enabled, each of said decoders being responsive to at least a same one of said instructional signals;

means responsive to a preselected instructional signal from said first memory for simultaneously enabling both of said decoders in the presence of said preselected instructional signal; and



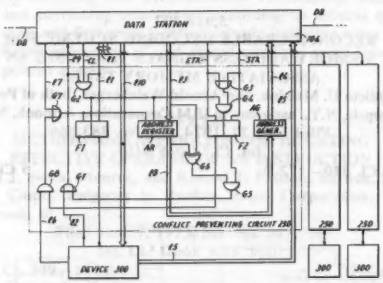
said decoders including means responsive to said preselected instructional signal from said first memory for initiating simultaneous, unique terminal operations, said unique terminal operations being operationally compatible and capable of being executed simultaneously in response to said preselected instructional signal from said first memory.

3,958,226

DATA COMMUNICATION SYSTEM

Takeshi Kuroda, Nagaokakyo; Saburo Hirai, Kyoto; Yujiro Sazanami, Nagaokakyo, and Hidekuni Nakao, Chofu, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto and Nippon Mining Co., Ltd., Tokyo, both of, Japan

Filed Aug. 30, 1974, Ser. No. 501,873
Claims priority, application Japan, Sept. 8, 1973, 48-101410
Int. Cl.² H04J 3/00
U.S. Cl. 340—172.5 14 Claims



1. A data communication system comprising:

a common data transmission path connected in a loop fashion;

a plurality of data stations provided along said data transmission path in a cascade fashion;

at least two data processing units, coupled to a separate said data station and for transmitting data through the data station associated therewith along said data transmission path,

at least one controllable device coupled to one of said data stations controllable in response to said data received from the data station associated therewith,

said data transmitted from each of said data processing units comprising a device identifying data for identifying one of said controllable devices to be selectively controlled, a controlling data for determining a manner of control of said controllable device to be selectively controlled, and a unit identifying data for identifying the respective data processing unit,

said controllable device being adapted to be controllable in response to said controlling data received from the data station associated therewith and to generate a status signal representing whether or not said device is in operation under said controlling data,

first store means interposed between said controllable device and the data station associated therewith for storing its own device identifying data received from said associated data station for keeping its own controllable device enabled,

second store means interposed between said controllable device and said data station associated therewith for storing said unit identifying data of one of said data processing units communicating at a given time with said controllable device being controlled at said given time by said controlling data transmitted from said one data processing unit,

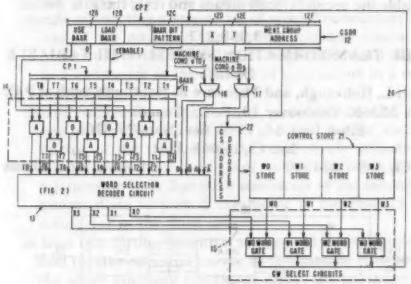
latching means responsive to said status signal from said controllable device for latching said first and second store means while said controllable device is in operation by said controlling data, thereby preventing said first and second store means from restoring a device identifying data and a unit identifying data transmitted from a different data processing unit while said controllable device is in operation by said controlling data of said one data processing unit, and

means responsive to said unit identifying data from said different data processing unit for transmitting said status signal back to said different data processing unit.

3,958,227
CONTROL STORE SYSTEM WITH FLEXIBLE CONTROL WORD SELECTION

Charles W. Evans, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 24, 1974, Ser. No. 508,797
Int. Cl.² G05B *19/24*; G06F *13/08*
U.S. Cl. 340—172.5 **9 Claims**



1. In a control store control system which has a control store containing branch groups of control-word positions, a branch group accessed by a next address from a current control-word contained in a control store data register, and machine-state circuits providing machine-state outputs used for selecting a control-word position in the branch group accessed in the control store, the improvement comprising,

a branch address translation register (BAXR),

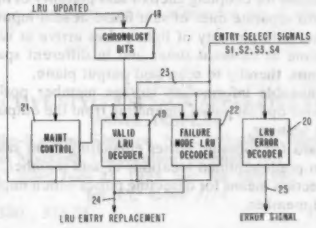
a special BAXR field in the control store data register, a BAXR in-gate circuit connected between the special BAXR field and the BAXR,

a word selection decoder circuit having inputs connected to said machine-state outputs, means for connecting outputs of the branch address translation register to inputs of the word selection decoder circuit, whereby said word selection decoder circuit activates one of plural control-word select lines in response to said machine-state outputs and a bit pattern set in said branch address translation register.

3,958,228
FAULT TOLERANT LEAST RECENTLY USED ALGORITHM LOGIC

Daniel J. Coombes, Glen Ellyn, Ill., and Benedicto U. Messina, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 20, 1975, Ser. No. 560,421
Int. Cl.² G06F *7/00*
U.S. Cl. 340—172.5 **5 Claims**



1. A system for producing a binary code signifying the order of use of a plurality of units randomly utilized in sequence including in combination:

storage means for a binary code;

select signalling means associated with each of the units for indicating use of the associated unit;

first logic means, connected to said storage means and said select signalling means, for producing a binary code in said storage means indicating the most recent order of use of the units;

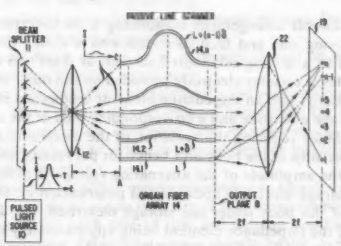
fault signalling means for indicating units eliminated from further use;

second logic means, connected to said storage means, said select signalling means, and said fault signalling means, for producing a binary code in said storage means having a first portion identifying the faulty units, and a second portion indicating the most recent order of use of the units not eliminated from further use.

3,958,229
OPTICAL MEMORY SYSTEMS UTILIZING ORGAN ARRAYS OF OPTICAL FIBERS

Michel Albert Duguay, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 401,635, Sept. 28, 1973, Pat. No. 3,892,468. This application Mar. 10, 1975, Ser. No. 556,637
Int. Cl.² G11C *11/42*, *13/04*
U.S. Cl. 340—173 LM **3 Claims**



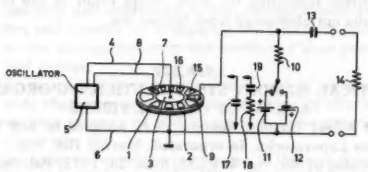
1. An optical memory system comprising:

1. a passive optical scanner comprising
   a. means for producing from a light pulse of duration T a plurality of light pulses propagating along spatially separate paths, each of said plurality being substantially identical in transverse shape to the light pulse from which it is produced,
   b. a first array of optical fibers of different lengths with the difference in length between functionally adjacent fibers being uniform, each of said fibers being arranged so that one end thereof terminates in an input plane and the opposite end thereof terminates in an output plane, said difference in length producing a substantially uniform difference in time delay $\Delta\tau_1$ between functionally adjacent fibers so that $\Delta\tau_1 > T$, and
   c. means for coupling each of said plurality of light pulses into separate ones of said fibers at said input plane so that said plurality of light pulses arrive at said output plane at different times and in different spatial locations, thereby to scan said output plane,
2. a movable information storage member positioned to receive optical pulses emanating from the output plane of said scanner,
3. means for focusing pulses emanating from said scanner onto predetermined locations of said member, and
4. detection means for detecting pulses which impinge upon said member.

3,958,230
ARRANGEMENT INCLUDING A PIEZO-FERROELECTRIC BODY

August Petersen, Henstedt-Ulzburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 7, 1974, Ser. No. 521,587
Claims priority, application Germany, Nov. 10, 1973, 2356256
Int. Cl.² G11C *11/22*
U.S. Cl. 340—173.2 9 Claims

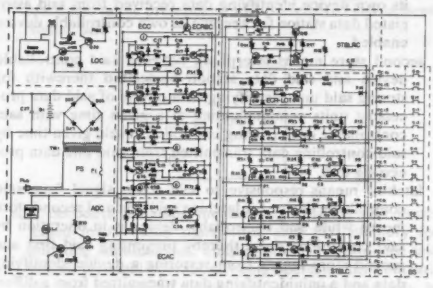


1. A circuit arrangement comprising a piezo-ferroelectric body having one end face provided with a driver electrode coupled to a driving oscillator and with at least two storage electrodes, a counter electrode provided on the other end face of said body, and an impedance element connected between one storage electrode and a corresponding part of the counter electrode for reducing the variation of the electromechanical characteristics of the body and hence for preventing the variation of the amplitude of the alternating voltage at at least one other storage electrode upon partial polarisation or depolarisation of the body under the storage electrode, the absolute value of the impedance element being approximately equal to the absolute value of the impedance of the inherent capacitance of the relevant part of the piezo-ferroelectric body at the oscillator frequency.

3,958,231
SEQUENTIAL TIME-BASE LOCK SYSTEM

Ronald J. Hoffman, 752 Delverne Ave., SW., Canton, Ohio 44710

Filed July 1, 1974, Ser. No. 484,439
Int. Cl.² G05B *1/00*
U.S. Cl. 340—274 C 10 Claims

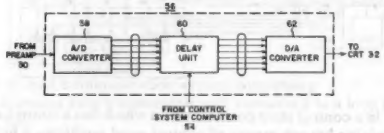


1. An electronic lock system for performing a locking and unlocking work function upon receiving a plurality of input signals in a predetermined sequence and time relationship to said system comprising, first circuit means including at least one gate circuit, time-based circuit means in said gate circuit, second circuit means including locking circuit means, third circuit means connectable to said gate circuit and said second circuit means, means for sequentially applying two input signals to said gate circuit required to be separated one from the other by an interval of time determined by the time period of said time-based circuit means to provide an output signal from said one gate circuit to effect the actuation of said second circuit means, said time-based circuit means being operable provided the second sequentially applied input signal to said one gate circuit is applied before the expiration of the time period of said time-based circuit means to provide a signal output therefrom effective to actuate the third circuit means to disable the second circuit means and reset the gate circuit.

3,958,232
IMAGE TRANSFORMATION SYSTEM WITH VARIABLE DELAY

Gilbert L. Hobrough, and Theodore B. Hobrough, both of P.O. Box 35369, Vancouver 13, B.C.,, Canada

Filed June 14, 1974, Ser. No. 479,470
Int. Cl.² G06F *3/14*
U.S. Cl. 340—324 AD 6 Claims

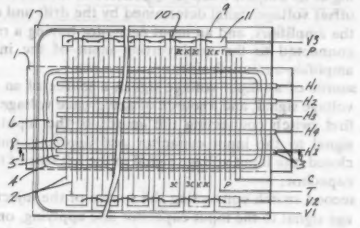


1. A system for the transformation of images comprising:
   a. scanning means for examining the image to be transformed so as to generate a first time-varying video signal representative of said image;
   b. variable delay means operative to instantaneously increase or decrease the amount of delay therein, said delay means being operatively connected to said scanning means, said delay means being operative to store said first time-varying video signal and to generate a second time-varying video signal which is a function of said first time-varying video signal and the instantaneous delay of said variable delay means; and
   c. reproduction means operatively connected to said variable delay means.

3,958,233
MULTIPHASE DATA SHIFT DEVICE

Jerry D. Schermerhorn, Swanton, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed July 31, 1974, Ser. No. 493,366
Int. Cl.² G08B 5/36
U.S. Cl. 340—324 M 28 Claims



1. A gas discharge display panel and associated electronic means for applying potential signals to the panel,

the gas discharge display panel being characterized by an ionizable gaseous medium and having a pair of opposing conductor arrays transversely oriented so as to define a matrix of gas discharge cells within the gaseous medium in the vicinity of a matrix of conductor crosspoints, the conductors of at least one array being insulated from the gaseous medium by at least one dielectric member,

the associated electronic means comprising at least first, second and third potential sources, at least two of the sources having waveforms which are in phase with respect to each other and which are out of phase with respect to the waveform of at least one of the remaining sources at any selected instant of time,

means connecting a first set of spaced conductors in one of the arrays to the first potential source,

means connecting a second set of spaced conductors in said one of the arrays to the second potential source, each conductor of the second set being respectively adjacent to a conductor in the first set of conductors in a one-to-one relationship,

means connecting a third set of spaced conductors in said one of the arrays to the third potential source, each conductor of the third set being respectively adjacent to a conductor in the second set of conductors in a one-to-one relationship such that each conductor of the second set is intermediate to both a conductor in the first set and a conductor in the third set,

at least one further potential source and means connecting said further potential source to at least one conductor on the other opposing conductor array, the combination of the further potential source and each of at least two of the other potential sources constituting a first composite potential waveform

a. which causes discharge sequences to occur at adjacent discharge cells near the crosspoint vicinity of adjacent conductors when at least one cell has been in a discharge state in an immediately preceding time interval, or

b. which causes no discharge sequence to occur at adjacent discharge cells near the crosspoint vicinity of adjacent conductors when neither cell has been in a discharge state in an immediately preceding time interval in either instance (a) or (b), each said adjacent conductor of said one array being connected to potential sources having waveforms which are substantially in phase,

at least one other conductor of said one array connected to at least one potential source having its waveform out of phase with the waveforms of said in phase potential sources of said adjacent conductors of said one array,

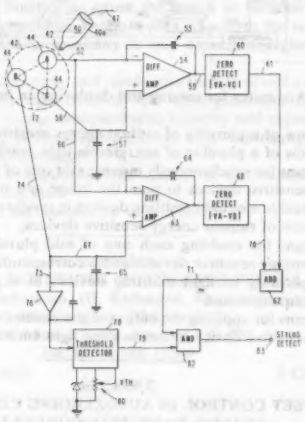
the combination of the further potential source and each out of phase potential source constituting a second composite waveform which prohibits the continuance of a discharge at a cell near the crosspoint vicinity of a conductor connected to the out of phase potential source.

22. In a gas discharge display panel having a cross conductor matrix constituted by dielectrically coated conductor arrays defining discharge sites in said panel, and means for applying operating potentials to said sites such that a selected number of adjacent ones of said sites constitute an operational logic element for entry of information to said panel, the improvement comprising means for shifting said operational logic element comprising a plurality of discharge sites with information entered thereto to a selected set of sites in said panel.

3,958,234
INTERACTIVE STYLUS SENSOR APPARATUS FOR GAS PANEL DISPLAY

Stanley Shu-Ku Hoo, Kingston, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 23, 1975, Ser. No. 589,105
Int. Cl.² G06F 3/14
U.S. Cl. 340—324 M 13 Claims



1. In a gas panel display having row and column coordinate conductors forming a matrix of selectable light emitting cells and including control means for selectable writing or igniting desired cells, erasing or extinguishing previously written cells, and sustaining previously written cells in the ignited state, sensor apparatus for signaling the coordinate position of a stylus on the display, comprising:

a hand-held stylus having a narrowed tip area for engagement with said display means;

at least three spaced sense members in said tip each said member being of equal area;

means for applying a sense signal pulse successively to each or some sub-set of said column conductors for initiating a column sense operation, and successively to each or some sub-set of said row conductors for initiating a row sense operation;

differential amplifier means responsive to signals generated by said sense pulses on pairs of said sense members positioned on each side of row and column conductors for generating differential sense signals below a predetermined magnitude level for at least one row and column conductor between a pair of sense members;

signal responsive means responsive to said sense signals below said predetermined level for generating row and column sense signals;

signal pickup means responsive to a signal exceeding a predetermined level induced in said tip area during the generation of row and column sense signals for generating no false detect signals; and

logic means responsive to row and column sense signals and coincident no fault detect signals, for generating row and column detect signals signaling the coincident position of the stylus on the gas panel.

3,958,235

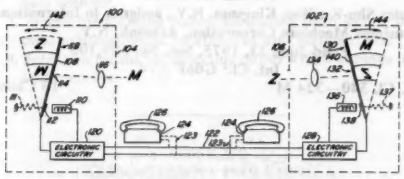
LIGHT EMITTING DIODE DISPLAY APPARATUS AND SYSTEM

Francis A. Duffy, 5039 Smedley St., Philadelphia, Pa. 19141

Filed July 26, 1974, Ser. No. 492,245

Int. Cl.[2] G09F 9/32

U.S. Cl. 340—336 28 Claims



1. Apparatus for sensing and displaying an image, comprising:

a row of a plurality of radiant energy sensitive devices;

a row of a plurality of energizable light emitting devices;

means for synchronously moving said row of radiant energy sensitive devices to scan the image and means to move said row of light emitting devices in synchronism with said row of radiant energy sensitive devices;

means for enabling each one of said plurality of radiant energy sensitive devices and a corresponding one of said plurality of light emitting devices in a predetermined sequence; and

means for applying the output of the enabled radiant energy sensitive device to the enabled light emitting device.

3,958,236

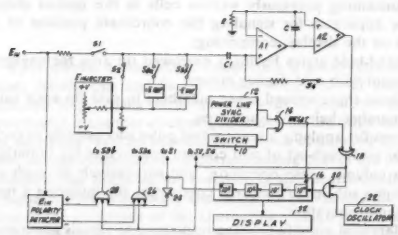
OFFSET CONTROL IN AUTOZEROING CIRCUITS FOR ANALOG-TO-DIGITAL CONVERTERS

Austin T. Kelly, Morristown, N.J., assignor to Weston Instruments, Inc., Newark, N.J.

Filed Dec. 18, 1974, Ser. No. 534,149

Int. Cl.[2] H03K 13/20

U.S. Cl. 340—347 NT 20 Claims



1. A measuring device comprising:

an integrating amplifier and a detector amplifier each having a noninverting input and an inverting input and an output,

an integrating capacitor connected between the inverting input and the output of the integrator amplifier, an integrating resistor connecting the inverting input of the integrator amplifier to ground, means for connecting the output of the integrator amplifier to the inverting input of the detector amplifier, means for connecting the inverting input of the integrator amplifier to the noninverting input of the detector amplifier, said detector amplifier providing at its output, when its inputs are at the same level, an offset voltage signal determined by the drift and offset of the amplifiers, and an input capacitor having a right side connected to the noninverting input of the integrator amplifier and a left side;

a source of an input voltage signal, a source of an injected voltage signal, and a source of a reference voltage signal;

a first switch connecting the source of the input voltage signal to the input capacitor and applying, only when closed, the input voltage signal to the left side of the input capacitor;

a second switch connecting the source of the injected voltage signal to the input capacitor and applying, only when closed, the injected voltage signal to the left side of the input capacitor;

a third switch connecting the sources of the injected and the reference voltage signals to the input capacitor and applying, only when closed, the combination of the injected and the reference voltage signals to the left side of the input capacitor;

a fourth switch connecting the detector amplifier output and the input capacitor and applying, only when closed, the offset voltage signal from the output of the detector amplifier to the right side of the input capacitor;

means for maintaining the second and fourth switches closed and the first and third switches open for an initial time interval whose duration is sufficient to store in the input capacitor an initial charge determined by the relative levels of the injected voltage signal and the offset voltage signal;

means for maintaining the first switch closed and the second, third and fourth switches open for a subsequent time interval of a fixed duration, which is substantially shorter than the duration of the initial time interval, to apply to the noninverting input of the integrator amplifier during said fixed time interval a measurement signal determined by the combination of the input voltage signal and the initial charge of the input capacitor; and

means for maintaining the third switch closed and the first, second and fourth switches open for a subsequent, variable time interval which ends when the inputs of the detector amplifier reach the same level, to apply to the noninverting input of the integrator amplifier during this variable time interval a voltage signal determined by the combination of the injected voltage signal, the reference voltage signal and the initial charge of the input capacitor.

3,958,237

ACOUSTIC TO PULSE CODE TRANSDUCER

John E. Fulenwider, Concord, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 31, 1975, Ser. No. 563,870

Int. Cl.[2] H04R 23/00; H04J 3/06

U.S. Cl. 340—347 AD 8 Claims

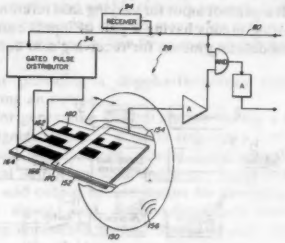
1. Apparatus for converting an analog acoustic signal into a series of digital words, each having N bits and being related to the instantaneous absolute value of the acoustic signal, including;

a. an acoustic device receiving the acoustic signal and having an output member whose position is related to the instantaneous value of the acoustic signal,

b. a source of pulses, each pulse having a width T,

c. a gated pulse distributor means responsive to the pulses from the pulse source for generating N time separated

output pulses for each pulse, each output pulse having a width of T/N where N is an integer greater than one, the output pulses corresponding to a particular pulse from the source occurring during the time interval of the pulse, and



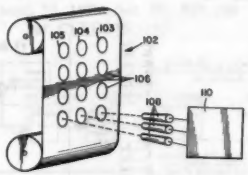
d. binary coded variable capacitive coupling means responsive to the output pulses and the position of the output member for providing a serial N bit digital word which is related to the position of the output member and thus to the absolute value of the acoustic signal at each occurence of the pulse, the movable member controlling the surface area of at least one of a pair of opposed conductive plates forming the coupling means.

3,958,238

BINARY CONCATENATED CODING SYSTEM

Leo G. Monford, Jr., Texas City, Tex., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 14, 1972, Ser. No. 315,070
Int. Cl.² H03K *73/00*
U.S. Cl. 340—347 P **2 Claims**



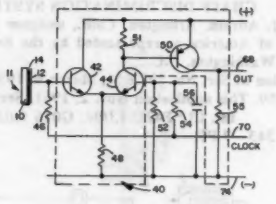
1. A binary concatenated measuring system comprising:
1. an elongated record such as a linearly transportable tape having three parallel rows or columns of coded data entries, an entry in each row or column being aligned with an entry in each of the other two rows or columns, each said entry being expressed as a binary digit or equivalent so that the sum of any three aligned entries expresses a physical measurement according to a binary concatenated code in which the first seven numbers of any decimal system decade correspond to the first seven digital data of the binary numbering system, the eighth such number of any such decade is a zero, and the ninth and tenth such numbers are chosen ones of said first seven digital data of the binary numbering system so selected that they may be interpreted by machine operation to indicate the decade in which they lie;
2. sensing means adjacent said tape to scan successive sets of aligned entries; and
3. readout means connected to said sensing means to display or record the readout thereof.

3,958,239

CAPACITIVE TRANSISTORIZED SIGNALING DEVICE

Robert E. Green, 1105 E. Oxford, Santa Ana, Calif. 94903

Continuation-in-part of Ser. No. 237,619, March 24, 1972. This application Sept. 27, 1973, Ser. No. 401,261
Int. Cl.² G08C *9/02*
U.S. Cl. 340—365 R **25 Claims**



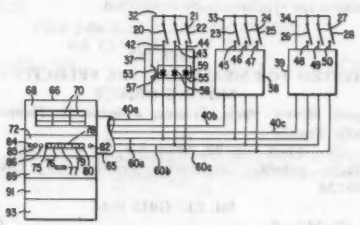
1. A switch comprising:
a capacitive registering element having a conductive surface for purposes of acting as a capacitive element in conjunction with a second body placed in proximity thereto:
a means for generating a signal having sufficiently the slope of a step function to cause the switch to function as a slope differentiation detector with respect to the second body placed in proximity to said capacitive registering element;
means for connecting said conductive surface of said capacitive registering element to said signal generation means so that a change in capacitance between said capacitive registering element and a second body will change the rise time of the slope;
an amplifier connected to said conductive surface and said signal means; and,
an electrical load connected to said amplifier.

3,958,240

ALARM AND STATUS MONITORING SYSTEM

Edward M. Richardson, III, Richmond, Va., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Mar. 6, 1973, Ser. No. 338,493
Int. Cl.² G08B *19/00*
U.S. Cl. 340—413 **3 Claims**



1. A condition monitoring system comprising
a plurality of condition means, each for operating in response to a condition, having at least first and second groups of condition means;
sequencing means for sequentially generating a set signal, a first signal and a second signal;
first sensing means responsive to the first signal for sensing the operation of any condition means in the first group of condition means;
second sensing means responsive to the second signal for sensing the operation of any condition means in the second group of condition means;

indicating means responsive to any of the first and second sensing means sensing a condition for indicating the presence of the condition;

manual switch; and

operation changing means responsive to a coincidence of the operation of the switch and a set signal for changing the operation of the indicating means.

3,958,241

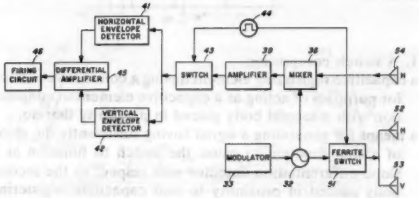
CHAFF DISCRIMINATION SYSTEM

Donald J. Adrian, Arlington, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 797,816, March 6, 1959, Pat. No. 3,918,059. This application Nov. 2, 1961, Ser. No. 149,788

Int. Cl.[2] F42C *13/04*; G01S *9/02*

U.S. Cl. 343—7 PF **1 Claim**



1. A microwave radio fuze system for a missile having means for discriminating between a target and chaff comprising in combination, a pair of oppositely polarized transmitting antennas operably connected to a frequency modulated oscillator by a first switch means, a receiving antenna polarized in the same direction as one of said transmitting antennas, mixing means operably associated with said receiving antenna for mixing a portion of a transmitted signal with a received echo signal, amplifier means adapted to amplify said mixing means output, a pair of envelope detectors operably connected to said amplifying means by a second switch means, a difference amplifier adapted to receive the output from said pair of envelope detectors whereby a firing signal is provided by said difference amplifier when the output of a certain one of said detectors exceeds the output of said other detector, and means for controlling said first and second switch means whereby said pair of transmitting antennas and said pair of detectors are synchronously controlled.

3,958,242

SYSTEM FOR MEASURING THE VELOCITY OF A MOVING OBJECT

Jacques Sirven, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Aug. 22, 1974, Ser. No. 499,564

Claims priority, application France, Aug. 24, 1973, 73.30738

Int. Cl.[2] G01S *9/44*

U.S. Cl. 343—8 **6 Claims**

1. A system for measuring, with the aid of the Doppler effect, the velocity of a moving object with respect to a fixed object as projected onto a reference axis, comprising:

antenna means trained along said axis;

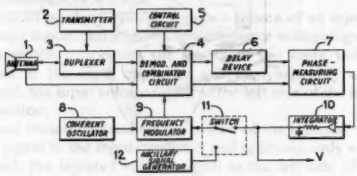
transmitting means coupled to said antenna means for sending out waves toward said fixed object for reflection thereby;

receiving means coupled to said antenna means for collecting waves reflected by said fixed object and deriving therefrom a sum signal Σ and a difference signal Δ which are functions of angular velocity divergences from said axis;

demodulating means connected to said receiving means and including circuitry for additively and subtractively combining said sum and difference signals and synthesizing composite signals $\Sigma + kj\,\Delta$ and $\Sigma - kj\,\Delta$ therefrom, k being a selectable coefficient;

frequency-generating means connected to said demodulating means for supplying a variable reference frequency thereto, said frequency-generating means being provided with a control input for varying said reference frequency;

measuring means having a pair of inputs connected to said demodulating means for receiving said composite signals



therefrom with a predetermined relative delay and for emitting an output signal proportional to the phase difference of the relatively delayed signals $\Sigma + kj\,\Delta$ and $\Sigma - kj\,\Delta$, said phase difference varying with the velocity of the moving object as projected onto said axis; and

integrating means connected between said measuring means and said control input for feeding back to said frequency-generating means a corrective voltage to stabilize said output signal.

3,958,243

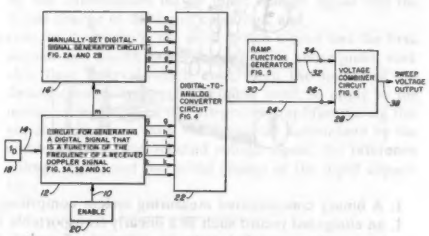
CIRCUIT FOR GENERATING A DIGITAL OR ANALOG SIGNAL AS A FUNCTION OF DOPPLER FREQUENCY

John L. Linder, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 436,415, Jan. 25, 1974, Pat. No. 3,893,115. This application Mar. 20, 1975, Ser. No. 560,060

Int. Cl.[2] G01S *9/44*

U.S. Cl. 343—8 **6 Claims**


MANUALLY-SET DIGITAL-SIGNAL GENERATOR CIRCUIT FIG. 2A AND 2B
DIGITAL-TO-ANALOG CONVERTER CIRCUIT FIG. 4
RAMP FUNCTION GENERATOR FIG. 5
VOLTAGE COMBINER CIRCUIT FIG. 6
SWEEP VOLTAGE OUTPUT
CIRCUIT FOR GENERATING A DIGITAL SIGNAL THAT IS A FUNCTION OF THE FREQUENCY OF A RECEIVED DOPPLER SIGNAL FIG. 3A, 3B AND 3C
ENABLE

1. A circuit for generating an analog voltage that is a function of the frequency of a received doppler signal in a doppler satellite tracking station comprising:

a. a multiple-bit counter circuit having a first and a second input and a plurality of outputs;

b. means for providing a doppler frequency signal having an output;

c. a first gate circuit having an output and a first and a second input, said output being connected to said first input of said counter circuit, said first input of said gate circuit being connected to said output of said means for providing a doppler frequency signal;

d. a storage register having a plurality of inputs connected to said plurality of outputs of said counter circuit such that said counter circuit and said storage register are in parallel, said storage register having a plurality of outputs, said plurality of outputs being a binary digital signal that

is a function of the frequency of said doppler-frequency signal, said storage register also having a clock input;

e. a digital-to-analog converter circuit having an input circuit and an output, said output being said analog voltage;

f. means for providing an enable signal;

g. means for gating in parallel said binary digital signal from said plurality of outputs of said storage register to said input circuit of said digital-to-analog converter input circuit whenever said enable signal is present, said enable signal being connected to said means for gating;

h. means for providing a low-frequency signal having an output;

i. means for providing a doppler-frequency correlation signal having an output;

j. a circuit for generating control signals having a low-frequency signal input, a doppler-frequency correlation input, a gate signal output, a reset signal output, and a clock signal output, said low-frequency input being connected to said output of said means for providing a low-frequency signal, said doppler-frequency correlation input being connected to said output of said means for providing a doppler-frequency correlation signal, said gate signal output being connected to said second input of said gate circuit whereby said gate circuit is enabled when a control signal is at a logic 1 level on said gate signal output, said reset signal output being connected to said second input to said counter circuit whereby said counter circuit is reset when a control signal is present on said reset signal output, said clock signal output being connected to said clock input of said storage register wherein said storage register shifts the contents of said counter circuit into itself only when a control signal is present on said clock signal output, thereby said storage register remembers said digital signal that is a function of the frequency of said doppler-frequency signal until a control signal is present on said clock signal output.

3,958,244

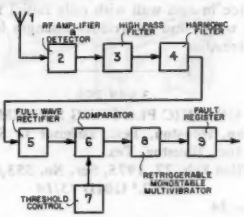
TRANSMITTER OUTPUT MONITOR

James Goon Nam Lee, c/o Universal Printing Press, 19 Jardine Crescent,, Causeway Bay, Hong Kong, Hong Kong, and Christopher James O'Hara, 25 Croydon Ave., Croydon, New South Wales, Australia

Filed Sept. 25, 1974, Ser. No. 509,206

Int. Cl.² G01S *1/38*

U.S. Cl. 343—106 D **2 Claims**



2. A transmitter output monitor for use with a transmitter the output of which includes a modulating signal of constant frequency and constant relative amplitude, comprising a monitor antenna placed in the vicinity of the transmitter antenna, means for amplifying and detecting the output from the transmitter picked up by the monitor antenna, filtering means for separating from the modulation the modulating signal of constant frequency and constant relative amplitude and for removing harmonics therefrom, full wave rectifier means for deriving a series of unidirectional pulses at twice the frequency of the said modulating signal, and means responsive to the absence of one or more of the unidirectional pulses for registering a fault and initiating predetermined action.

3,958,245

ANTENNA WINDSHIELD

Joseph P. Cherenko, Valencia, and Hugh E. Shaw, Jr., New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 400,765, Sept. 26, 1973, abandoned. This application Mar. 27, 1974, Ser. No. 455,469

Int. Cl.² H01Q *1/32*

U.S. Cl. 343—713 **7 Claims**

1. A transparent laminated antenna windshield comprising a single sheet of glass, a layer of polyvinyl butyral having elongated wire of electroconductive material embedded in said layer in close juxtaposition to but spaced from one surface thereof, said layer and wire laminated to said glass sheet with said one surface bonded to the interior surface of said sheet of glass, said wire being adapted for coupling to a radio for use as an antenna circuit element when said windshield is installed in a vehicle, the circuit formed on said coupling having a higher Q-value than a similar circuit formed on a windshield similarly installed but also comprising a second sheet of glass laminated to said opposite surface of said layer of polyvinyl butyral.

3,958,246

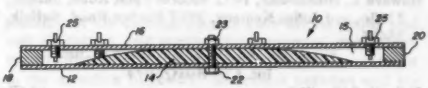
CIRCULAR RETRODIRECTIVE ARRAY

Robert J. Wohlers, Orchard Park, and Stephen N. Andre, Eden, both of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

Filed July 5, 1974, Ser. No. 485,864

Int. Cl.² H01Q *3/26, 19/06*

U.S. Cl. 343—754 **9 Claims**



1. A retrodirective array antenna comprising:

housing means including a base plate and a cover plate which are separated by spacer means to define a substantially cylindrical chamber;

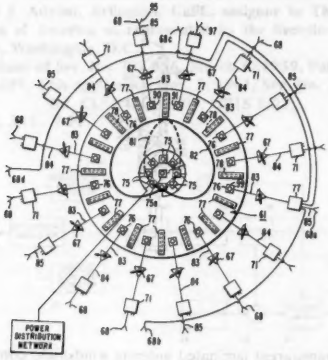
a plurality of pairs of diametrically located array elements circumferentially located on said cover plate to extend outwardly therefrom and having probe means extending into said chamber; and

lens means located within said chamber for focusing and directing energy between said elements of said pairs of diametrically located array elements.

3,958,247
RF POWER COUPLING NETWORK EMPLOYING A PARALLEL PLATE TRANSMISSION LINE

Bruce Fredric Bogner, Mount Holly, and David Francis Bowman, Moorestown, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,814
Int. Cl.² H01Q *3/26, 17/00*
U.S. Cl. 343—754 **11 Claims**



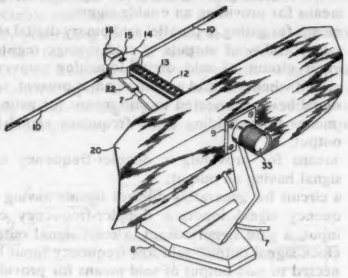
1. A network for coupling radio frequency signals between a plurality of terminals and a single terminal comprising:
- an enclosed transmission line including a pair of conductive plates spaced parallel to each other with a dielectric medium therebetween and with a conductive ring-like band about the periphery thereof.
- a centrally located coupling member coupled to said single terminal and in communication with the center of said enclosed transmission line,
- a plurality of coupling members coupled to said plurality of terminals and in communication with said enclosed transmission line at points spaced radially from and in a ring-like pattern about said center of said enclosed transmission line, and
- means including a plurality of narrow slots in at least one of said plates of absorbing radio frequency energy propagating between said plurality of coupling members.

3,958,248
TUNABLE DIPOLE ANTENNA FOR TELEVISION RECEIVERS

Howard E. Holshouser, 1472 Moores Point Road, Suffolk, Va. 22436, and Julius Kemeny, 2917 Harbor Road, Suffolk, Va. 23435

Filed Jan. 30, 1975, Ser. No. 545,308
Int. Cl.² H01Q *9/14*
U.S. Cl. 343—803 **10 Claims**

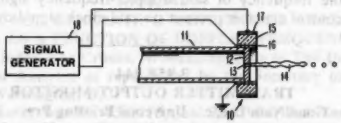
1. A directional antenna tunable over a band of frequencies comprising:
- a sheet reflector, said sheet reflector being of predetermined geometric shape,
- dipole means of adjustable span,
- support means for adjustably supporting said dipole means in operative relationship wih said reflector, and with
- adjust means coupled to said dipole means and operable to simultaneously adjust the span of said dipole means and the distance between said dipole means and said reflector to maintain a tuned relationship between said dipole means and said reflector for each of the frequencies in said band,
- said adjust means including control means immediately adjacent to and accessible from behind said reflector to enable tuning of said antenna without affecting the radiation characteristics thereof.



3,958,249
INK JET DROP GENERATOR

Frank J. DeMaine, Endwell; Robert E. Pelkie, Owego; Normand C. Smith, Endicott, and Reinhold E. Tomek, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1974, Ser. No. 534,039
Int. Cl.² G01D *15/18*
U.S. Cl. 346—1 **12 Claims**



1. The method of producing perturbations in an ink jet stream to cause breakup of said stream into successive drops comprising the steps of:
- forcing said liquid through an orifice in a wall of a chamber; and
- repetitively altering the configuration of the cross-section of said orifice in said wall with only radial forces to avoid standing waves and to produce changes in the flow rate of said stream.

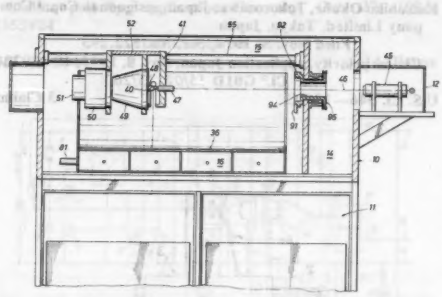
3,958,250
GRAPHIC PLOTTING SYSTEMS

Arnaldo Rolon, Houston, Tex., assignor to Sequential Data Machines, Inc., Houston, Tex.

Filed Feb. 27, 1975, Ser. No. 553,620
Int. Cl.² G01D *15/14*
U.S. Cl. 346—24 **7 Claims**

1. A photographic plotting system using a light to scan a photographic film comprising
- a plotting compartment including an arcuately curved wall surface disposed about a central axis over a first arc segment of a circle,
- photographic film means adapted to be disposed on said wall surface,
- a traverse frame disposed above said wall surface,
- guide means disposed across said compartment for supporting said traverse frame and for permitting movement of said traverse frame lengthwise of said film,
- means for moving said traverse frame on said guide means transversely to the length of said film,
- reflector means mounted on said traverse frame for directing light normal to said central axis, means on said frame

for rotating said reflector means, means on said frame for determining the angular position of said reflector means, means for generating and for directing laser light along said central axis and through the plotting compartment onto said reflector means, and



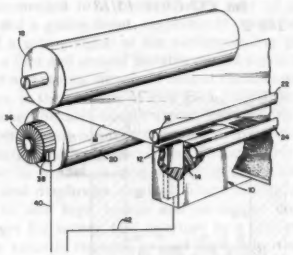
means for coordinating the angular position of said reflector means to said light means so that the light means is operative only when directed toward said film.

3,958,251

ELECTROGRAPHIC PRINTING SYSTEM UTILIZING MULTIPLE OFFSET STYLI

Ronald F. Borelli, Edmond, Okla., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 2, 1973, Ser. No. 320,420
Int. Cl.² G01D *15/06*; G03G *13/04*
U.S. Cl. 346—74 EE **5 Claims**



1. In an electrographic printing system of the type wherein a recording medium moving along a path has latent images formed thereon by selectively applying a high potential across the medium and wherein the latent image is subsequently made visible by applying a toner to the medium,

an electrode structure adjacent the path including a plurality of spaced rows of electrodes, successive electrodes in each of said rows being spaced from each other, the electrodes of successive rows being staggered;

means for selectively energizing each of said electrodes; and

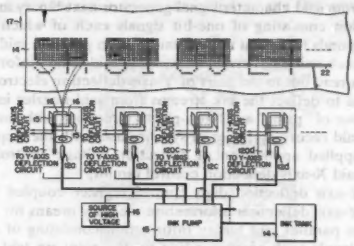
means for continuously maintaining the energization of selected ones of said electrodes to form elongated latent images substantially longer than the length of the electrodes in the direction of movement of the medium.

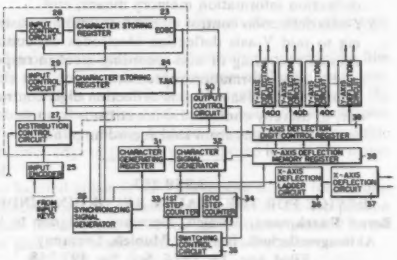
3,958,252

INK JET TYPE CHARACTER RECORDING APPARATUS

Toshio Kashio, Yamato, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 305,600, Nov. 10, 1972, abandoned.
This application July 29, 1974, Ser. No. 492,714
Claims priority, application Japan, Nov. 12, 1971, 46-89961; Nov. 12, 1971, 46-89962
Int. Cl.² G01D *15/18*
U.S. Cl. 346—75 **3 Claims**





1. An ink jet type character recording apparatus comprising:

a character storing register for storing character information to be recorded on a recording paper which is adapted to be movable;

a character signal generator coupled to said character storing register for reading out a group of characters of a line which define a unit character matrix from said character storing register and for generating successively character signals corresponding to points on lines of each unit character matrix for arranging ink droplets on line rasters to form unit characters included in said group of characters;

a plurality of ink ejection nozzles each for recording said unit characters, said nozzles being arranged at predetermined intervals in a direction substantially perpendicular to the direction of relative movement between said recording paper and said nozzles;

a pair of X-axis deflection electrodes associated with each of said nozzles and disposed along the path of the ink streams ejected from each nozzle and perpendicular to said direction of relative movement between said recording paper and said nozzles;

a pair of Y-axis deflection electrodes associated with each of said nozzles and disposed along the path of the ink stream ejected from each nozzle and parallel to said direction of relative movement between said recording paper and said nozzles;

an X-axis deflection control circuit for supplying a signal with a value changing stepwise simultaneously to said X-axis deflection electrodes so as to deflect said ink

streams from said nozzles in a direction perpendicular to the direction of the relative movement between said recording paper and said nozzles, thereby arranging ink droplets on line rasters;

a Y-axis deflection information memory means for receiving and temporarily storing binary information from said character signal generator, said binary information consisting of one-bit signals each of which correspond to a certain point on said line of each unit character matrix corresponding to a specific nozzle, said Y-axis deflection information memory means including means for receiving from said character signal generator next binary information consisting of one-bit signals each of which corresponds to a point next to said certain point on said line of each unit character matrix, while said binary information is read out to the pairs of Y-axis deflection electrodes, so as to deflect the ink streams from said nozzles in either one of "print" and "non-print" directions with respect to said recording paper in synchronism with the step of the applied application of deflection voltage controlled by said X-axis deflection control circuit;

a Y-axis deflection digit control register coupled to said Y-axis deflection information memory means for storing in parallel said binary information consisting of one-bit signals each corresponding to one point on said line of each unit character matrix corresponding to a specific nozzle, said binary information being stored in said Y-axis deflection information memory means; and

a Y-axis deflection control circuit for simultaneously applying to said Y-axis deflection electrodes deflection voltages of recording or non-recording level in response to said binary information representing each unit character signal stored in said Y-axis deflection digit control register, to thereby control said ink streams from said nozzles toward and away from said recording paper.

3,958,253

DEVICE FOR THERMALLY RECORDING INDICIA

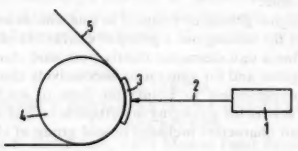
Bernd Rueckmann, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 15, 1974, Ser. No. 497,768

Claims priority, application Germany, Sept. 18, 1973, 2346923

Int. Cl.² G01D 15/14

U.S. Cl. 346—76 L **5 Claims**



1. A device for recording indicia on paper having heat responsive surface characteristics comprising: a signal controlled light source of high intensity, a thin material layer, the thin material layer having localized areas of high heat conductivity in a first direction surrounded by areas of low heat conductivity perpendicular to the first direction, the thin material layer being positioned between the light source and the paper on which the indicia is to be recorded and having a relatively high absorption ability with respect to light from the light source, the thin material layer positioned immediately adjacent the paper and effective to absorb the energy transmitted by a light beam from the signal controlled light source impinging thereon, the light source impinging on the thin material layer in the first direction, the thin material layer transforming the light beam energy into heat and effective to conduct said heat to said paper.

3,958,254

ELECTRONIC PRINTER

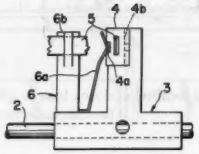
Katsuhiko Okabe, Tokorozawa, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Nov. 8, 1974, Ser. No. 522,293

Claims priority, application Japan, Nov. 8, 1973, 48-129204

Int. Cl.² G01D 15/02, 15/20

U.S. Cl. 346—139 C **3 Claims**



1. An electronic printer comprising a carriage, a printing head detachably mounted on said carriage and having two grooves extending perpendicular to each other thereon, a protrusion formed on said carriage and engaged with one of said two grooves, and a plate spring fixed on said carriage and engaged with the other of said two grooves.

3,958,255

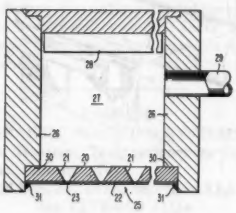
INK JET NOZZLE STRUCTURE

Charles Chiou, San Jose; Guido Galli, Saratoga; Karl H. Loeffler, San Jose, and Max R. Lorenz, Saratoga, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1974, Ser. No. 537,795

Int. Cl.² G01D 15/18

U.S. Cl. 346—140 R **8 Claims**



1. In a multi-orifice fluid jet head including a source of pressurized fluid, and manifold means communicating with said source, the improvement comprising:

a multi-orifice nozzle plate communicating with said manifold means and comprising

a planar monocrystalline substrate having a uniform array of aperture openings therethrough for said fluid; and

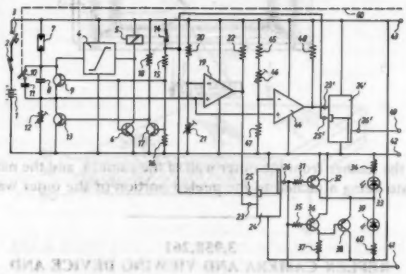
a deposited membrane of uniform thickness less than 1 mil coating and overlaying said substrate and having an array of uniform orifices therein for said fluid,

said orifices having approximately the same central axes as said aperture openings, and having smaller areal cross sections than said aperture openings.

3,958,256
PHOTOGRAPHIC CAMERA

Eduard Wagensonner, and Kurt Borowski, both of Aschheim, Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Oct. 24, 1974, Ser. No. 517,842
Claims priority, application Germany, Oct. 27, 1973, 2353924
Int. Cl.² G03B 7/08
U.S. Cl. 354—44 14 Claims



1. In a photographic camera having film, a shutter for admitting light to said film during an exposure time, light-sensitive means responsive to the light available for an exposure for furnishing a light-dependent signal varying as a function thereof, and a diaphragm having an aperture positioned in the path of said light for controlling the quantity of light falling on said film during said exposure time, apparatus for controlling the size of said aperture as a function of said light available for said exposure, comprising, in combination, first and second threshold means each having an input connected to said light-sensitive means, for furnishing, respectively, a first and second threshold output signal when said light-dependent signal is indicative of light within a first and second light range respectively; first and second bistable means each having a control input connected to a corresponding one of said threshold means and a gating input, respectively operative in the presence of a gating signal at the corresponding gating input to furnish a first and second bistable output signal in response to said first and second threshold output signal respectively, each operative in the absence of said gating signal to store the last so-furnished bistable output signal; logic means having a first and second input connected to said first and second bistable means respectively, for furnishing a logic output signal only in response to predetermined signals at said first and second inputs; and diaphragm control means having an input connected to said logic means and an output coupled to said diaphragm for setting said aperture to a first predetermined aperture value in response to said logic output signal and to a second predetermined aperture value in the absence of said logic output signal.

3,958,257
COMPACT REFLEX BOX CAMERA

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 30, 1974, Ser. No. 501,871
Int. Cl.² G03B 17/50, 19/12
U.S. Cl. 354—83 19 Claims

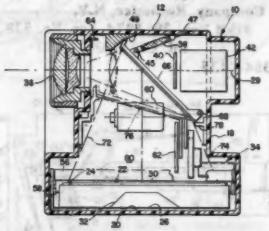
18. A photographic apparatus for use with film units of the self-developing type having a rupturable container adjacent one edge thereof, comprising:

a housing having a base portion defining a base plane, and a top portion disposed in spaced apart relation relative to said base portion;

objective lens means disposed relative to said housing for admitting scene light into said housing wherein said admitted scene light is centered about the optical axis of said objective lens means, said optical axis being substantially parallel to said base plane;

means disposed within said housing for defining a film plane substantially orthogonal to said base plane, said film plane accommodating the stationing of a film unit thereon so that the rupturable container adjoins that edge of the film unit furthest from said base portion;

reflecting means disposed within said housing to direct said scene light into impingement on said film plane when said camera is in a film exposure mode of operation so that the bottom of a scene image recorded on the film unit stationed on said film plane is adjacent the rupturable container;



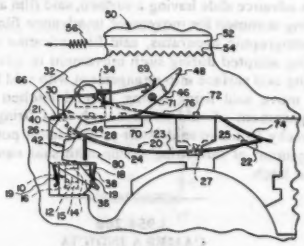
a fluid processing station for selectively processing the film units as the film units are transported through said processing station in a direction substantially parallel to the film plane and orthogonal to said base plane, said processing station being located adjacent the rupturable container edge of the film unit disposed in said film plane; and

means located adjacent said processing station for accommodating ejection of said film units from the top portion of said housing in a direction substantially parallel to the film plane and orthogonal to said base plane.

3,958,258
FLASH SHORTING MECHANISM

David Easton Beach, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 10, 1975, Ser. No. 567,030
Int. Cl.² G03B 15/03
U.S. Cl. 354—135 7 Claims



1. A photographic camera adapted for use with a flash unit, said camera comprising:

means, including a piezoelectric crystal, for generating electrical energy;

means for striking said generating means and thereby generating electrical energy;

means for retaining said striking means in a latched condition and for releasing said striking means for movement from said latched condition to strike said generating means;

means, including a pair of socket terminals electrically connected to said generating means, for directing generated electrical energy to a flash unit; and

means for electrically connecting said socket terminals whenever said striking means is in said latched condition and for electrically disconnecting said socket terminals whenever said striking means is not in said latched condition.

3,958,259

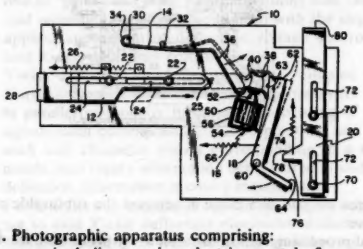
FIRING SPRING COCKING MECHANISM

Leonard G. Genesky, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,540

Int. Cl.² G03B *15/03*

U.S. Cl. 354—135 **1 Claim**



1. Photographic apparatus comprising:

means, including a piezoelectric crystal, for generating electrical energy;

a hammer;

a firing spring operatively engaged with said hammer and movable from a latched position to a striking position in which said hammer strikes said generating means;

a latch including a latch surface, a cam surface and an unlatching surface, said latch being mounted for movement between a latch position in which said latch surface is in engagement with and retains said firing spring in said latched position and an unlatched position in which said cam surface is engageable by said firing spring;

a body release lever including a flash actuating surface, said body release lever being movable to bring said flash actuating surface into engagement with said unlatching surface of said latch and further being movable while said flash actuating surface is in engagement with said unlatching surface to move said latch to said unlatched position; and

a film advance slide having a surface, said film advance slide being mounted for movement to advance film within, the photographic apparatus, said film advance slide further being adapted during such movement to advance film to bring said surface into engagement with said firing spring, to move said firing spring to said latched position by engagement of said surface with said firing spring and thereby to move said latch to said latch position by engagement of said firing spring with said cam surface on said latch.

3,958,260

CAMERA INDICIA

Wataru Nagasaka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

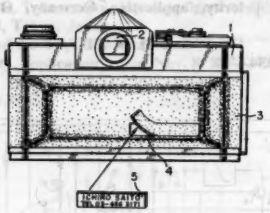
Filed July 2, 1973, Ser. No. 375,464

Claims priority, application Japan, July 17, 1972, 47-84157[U]

Int. Cl.² G03B *17/02*

U.S. Cl. 354—288 **1 Claim**

1. A camera having leather secured to the outer walls thereof wherein said leather has a thickness substantially equal to that of a name plate to be attached to the camera, and comprises a portion for attaching said name plate, said portion being surrounded by a line cut of the same configuration as the name plate to permit a user to easily peel off said portion



of the leather from the outer wall of the camera, and the name plate being attached to the peeled portion of the outer wall.

3,958,261

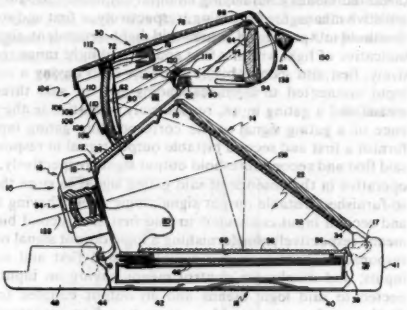
REFLEX CAMERA AND VIEWING DEVICE AND ATTACHMENT THEREFOR

Edwin H. Land, Cambridge, and Philip G. Baker, Peabody, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 4, 1974, Ser. No. 457,855

Int. Cl.² G03B *13/18*

U.S. Cl. 354—295 **11 Claims**



2. A photographic camera and viewing device, including:

means defining an optical axis through said viewing device;

eye lens means connected to said viewing device for forming an image of a subject to be photographed;

means defining an exit pupil outward of said eye lens means; and

means overlying said eye lens means for aiding the positioning of an observer's eye proximate said exit pupil for viewing said subject,

said aiding means comprising a mask of flexible sheet material formed with an opening defining an aperture and detachably attached to said viewing device so as to position the region of said mask containing said aperture generally in a surface normal to said optical axis between said eye lens means and said exit pupil proximate said exit pupil.

3,958,262

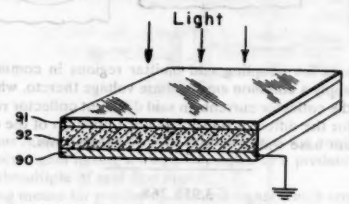
ELECTROSTATIC IMAGE REPRODUCING ELEMENT EMPLOYING AN INSULATING ION IMPERMEABLE GLASS

Seymour Merrin, Fairfield, Conn., assignor to Innotech Corporation, Norwalk, Conn.

Division of Ser. No. 227,932, Feb. 22, 1972, abandoned, Continuation-in-part of Ser. No. 122,422, March 9, 1971. This application Nov. 22, 1974, Ser. No. 526,164

Int. Cl.² H01L 45/00, 29/161

U.S. Cl. 357—2 8 Claims



1. An electrostatic image reproducing element comprising:
a semiconductive substrate having one kind of conductivity; and
disposed upon said semiconductive substrate a layer of an insulating ion impermeable glass having the other kind of conductivity from that of said substrate and containing a sufficient concentration of ionic impurities to possess useful conductivity.

3,958,263

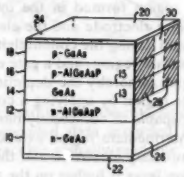
STRESS REDUCTION IN AlGaAs-AlGaAsP MULTILAYER STRUCTURES

Morton B. Panish, Springfield, and George Arthur Rozgonyi, Chatham, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 414,664, Nov. 12, 1973. This application Apr. 25, 1974, Ser. No. 463,871

Int. Cl.² H01S 33/19; H01L 29/161, 29/205

U.S. Cl. 357—18 10 Claims



1. A multilayer structure comprising
a first layer of $Al_xGa_{1-x}As$,
a second layer of $Al_yGa_{1-y}As_{1-z}P_z$ contiguous with said first layer,
the fraction y of Al is said second layer exceeding the fraction x of Al in said first layer, and
the fractions of Al, Ga and P in said first and second layers being mutually adapted to reduce the average stress in said second layer as compared with the stress which would be produced in the absence of phosphorus therein at substantially room temperature.

3,958,264

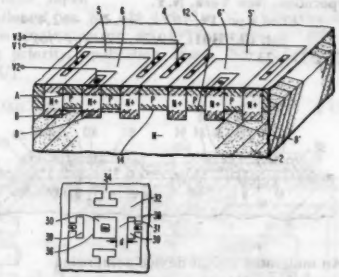
SPACE-CHARGE-LIMITED PHOTOTRANSISTOR

Steven Magdo, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 24, 1974, Ser. No. 482,178

Int. Cl.² H01L 27/14, 31/10

U.S. Cl. 357—30 8 Claims



1. A radiant energy responsive device comprising: a space-charge-limited transistor including a high resistivity substrate of a first conductivity type of at least 10,000 ohm-centimeter semiconductor material, a base zone of a second conductivity type and collector and emitter zones of said first conductivity type extending from one surface of said substrate into the interior thereof;
the depth of said base zone within said substrate being less than the reciprocal of the absorption coefficient of the incident radiant energy;
means for reverse-biasing said collector with respect to said base;
whereby upon the incidence of radiant energy on said device, space-charge-limited current is generated between the emitter and collector of said device.

3,958,265

SEMICONDUCTOR LIGHT-EMITTING DIODE AND METHOD FOR PRODUCING SAME

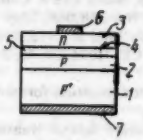
Revaz Alexandrovich Charmakadze, prospekt Vazha Pshavela, 6, vartal, 24 korpus, kv. 22; Rafael Iraklievich Chikovani, prospekt Vazha Pshavela, 39b, kv. 53, both of Tbilisi, and Zhores Ivanovich Alferov, Olginskaya ulitsa, 9, korpus 3, kv. 15, Leningrad, all of U.S.S.R.

Filed May 2, 1974, Ser. No. 466,585

Claims priority, application U.S.S.R., May 28, 1973, 1922832

Int. Cl.² H01L 33/00, 29/161, 29/205

U.S. Cl. 357—17 17 Claims



1. A semiconductor light-emitting diode comprising: a p^+-type GaAs substrate; and epitaxial p-type layer of a monocrystalline solid solution of $Al_x Ga_{1-x} As$ doped with Zn grown on said p^+-type substrate; an epitaxial n type layer of monocrystalline solid solution of $Ga_{1-x} Al_x A_s$ doped with Te; a p_c-type compensated layer of a monocrystalline solid solution of $Al_x Ga_{1-x} As$ doped with Zn and Te to a concentration less than or equal to the concentration of the n type epitaxial layer, disposed between said epitaxial layers and having a thickness less than or equal to the length of diffusion of the injected carriers of current in said n type epitaxial layer; a basic hetero-

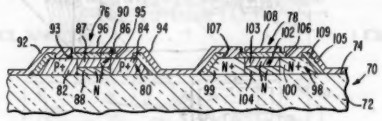
junction being formed between said epitaxial p-type and n-type layers.

3,958,266

DEEP DEPLETION INSULATED GATE FIELD EFFECT TRANSISTORS

Terry George Athanas, Frenchtown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 19, 1974, Ser. No. 462,494
Int. Cl.² H01L 29/78, 27/12, 27/02
U.S. Cl. 357—23 2 Claims



1. An integrated circuit device comprising:
an insulating substrate,
a plurality of thin, layerlike bodies of monocrystalline semiconductive material, all initially of the same given type conductivity on said substrate, and each having a surface substantially parallel to the surface of the substrate, and
means including at least one of said bodies forming an insulated gate field effect transistor operable in the deep-depletion mode, said means comprising spaced source and drain regions of said given type conductivity in said one body defining therebetween a conduction channel region, an insulating layer on said surface of said one body adjacent to said channel region and gate electrode means on said insulating layer, said channel region having a first part adjacent to said surface having a thickness less than that of said body, having said given type conductivity and having a conductivity such that a predetermined voltage applied to said gate electrode, relative to that applied to said body, will effectively deplete said first part of mobile charge carriers, said channel region also having a second part beneath said first part, extending throughout the remainder of the thickness of said channel region, having said given type conductivity and having a conductivity less than that of said first part such that a voltage substantially less than said predetermined voltage will effectively deplete it of charge carriers.

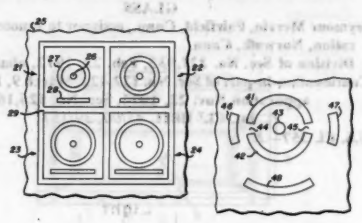
3,958,267

CURRENT SCALING IN LATERAL PNP STRUCTURES

Thomas M. Frederiksen, San Jose, and James L. Dunkley, Santa Clara, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 358,068, May 7, 1973, abandoned. This application June 5, 1975, Ser. No. 583,882
Int. Cl.² H01L 29/72, 27/02
U.S. Cl. 357—36 8 Claims

1. A lateral transistor structure formed in a semiconductive substrate comprising:
a plurality of separate lateral transistors formed in said substrate, each of said transistors including:
a base region of a first conductivity type formed in the surface of the substrate, the base regions for the transistors being electrically coupled together,
an emitter region of a second conductivity type formed in said base region, and
a collector region of a second conductivity type formed in said base region and spaced from said emitter region such that the distance between each said collector region and its associated emitter region for each transistor is a constant dimension over the length of said associated collector region, said distance forming a base width between said emitter region and each said associated collector region, the base widths of the different transistors being different, and



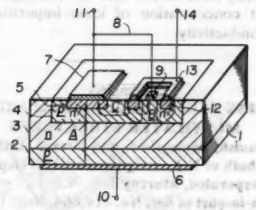
means for coupling said emitter regions in common to apply a common emitter-base voltage thereto, whereby the collector currents in said different collector regions for the different transistors are a function of the different base widths of said different transistors.

3,958,268

THYRISTOR HIGHLY PROOF AGAINST TIME RATE OF CHANGE OF VOLTAGE

Tatsuya Kamei, and Yoshikazu Hosokawa, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed May 3, 1974, Ser. No. 466,850
Claims priority, application Japan, May 8, 1973, 48-50973
Int. Cl.² H01L 29/74
U.S. Cl. 357—38 13 Claims



1. A thyristor comprising a semiconductor substrate in which adjacent regions having opposite conductivity types are arranged alternately, a pair of electrodes provided to the outermost regions of the semiconductor substrate, an auxiliary electrode provided to the intermediate region adjacent to one of the outermost regions, means for electrically connecting the auxiliary electrode and the electrode on the one outermost region, a control region formed in the intermediate region between the auxiliary electrode and the electrode on the one outermost region and having the conductivity type opposite to that of the intermediate region, and a gate electrode provided to the control region, whereby the depletion layer produced in the intermediate region by applying a control signal to the gate electrode is capable of completely blocking the conductive path in the intermediate region extending from the gate electrode to the auxiliary electrode and the breakdown voltage of the depletion layer is higher on the auxiliary electrode side than on the electrode-on-the-one-outermost-region side.

3,958,269

COLOR SUBCARRIER FREQUENCY COMPARATOR

Dicky D. Davis, Boulder, Colo., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

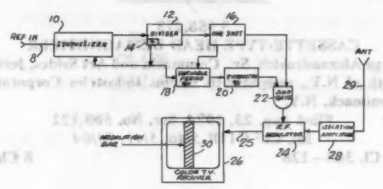
Filed Aug. 20, 1974, Ser. No. 499,102
Int. Cl.² H04N 9/62
U.S. Cl. 358—10 12 Claims

1. Apparatus for measuring the frequency of a reference signal which utilizes as a standard frequency signal the color

subcarrier signal of a color television receiver, which comprises:

synthesizer means for producing a first signal which is phase-locked to said reference signal and has a frequency substantially equal to an integral multiple of the frequency of said color subcarrier signal;

first frequency divider means responsive to said first signal for producing a second signal having a frequency at the horizontal sync rate of said color television receiver;



means further responsive to said first signal for producing a third signal having a frequency equal to a predetermined submultiple of said first signal;

gating means for producing a fourth signal which comprises bursts of said third signal at the rate of said second signal;

means for amplitude modulating an incoming RF television signal by means of said fourth signal; and

a color television receiver connected to receive the output from said modulating means.

3,958,270

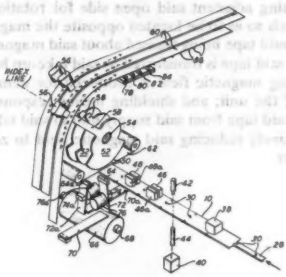
DOCUMENT-MARKING MACHINE

Richard C. Graniere, Clifton, and Patrick J. Marshall, Verona, both of N.J., assignors to Litton Business Systems, Inc., Belleville, N.J.

Filed Dec. 20, 1971, Ser. No. 209,970

Int. Cl.² G11B 5/00; B41J 45/00

U.S. Cl. 360—4 **12 Claims**



1. A machine for marking documents, said documents being adapted to have encoded data recorded thereon, and also being adapted to receive visually readable printing, said machine comprising:

a recording station including recording means for recording said encoded data on said documents;

a printing station including printing means for printing visually readable printed data on said documents, at least portions of said visually readable printed data and said encoded data being identical with one another;

error detection means for determining whether the encoded data has been correctly recorded on said documents by said recording means, said error detection means including reading means for reading from the documents the data which has been encoded thereon by said recording means; and

means responsive to detection of an error by said error detection means for preventing said printing means from printing said printed data on said document.

3,958,271

TRACKING CONTROL CIRCUIT USING A DELAYED TACH SIGNAL

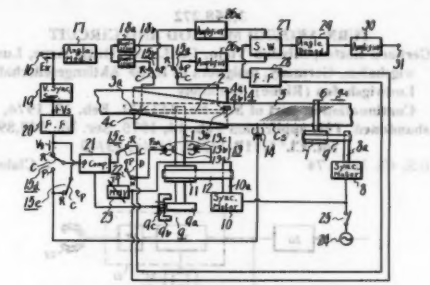
Koichiro Sumiyoshi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 411,415, Oct. 31, 1973, abandoned. This application Apr. 11, 1975, Ser. No. 567,051

Claims priority, application Japan, Nov. 11, 1972, 47-130036[U]

Int. Cl.² G11B 21/04, 21/10

U.S. Cl. 360—70 **5 Claims**



1. A video tape recorder in which a video signal is recorded on a magnetic tape as a plurality of skewed tracks by a rotary magnetic head which is rotated in synchronism with a frame frequency signal contained in the video signal and in which a recorded video signal is reproduced by the rotary magnetic head from the magnetic tape on which a control signal synchronized with the frame frequency is recorded comprising:

a. first and second rotary magnetic heads mounted on a support member and spaced apart by 180° and a tape guide drum for guiding the magnetic tape about the surface of the drum so that the rotary magnetic heads scan the tape;

b. a capstan for transporting the magnetic tape about the drum;

c. means for driving the capstan and head driving means for driving the rotary magnetic head;

d. a control signal magnetic head operable during a signal recording operation to record said control signal onto said magnetic tape and operable during a signal reproducing operation to reproduce the control signal from the magnetic tape;

e. a first transducer for detecting the position of the rotary magnetic heads and for generating an output signal when one of the rotary magnetic heads rotates into an initial tape contact position whereat the rotary magnetic head arrives proximate a recorded area corresponding to that associated with a reproduced control signal; and a second transducer angularly displaced from said first transducer by a predetermined amount for detecting the position of the rotary magnetic head and for generating a second output signal time displaced from said first output signal when the other rotary magnetic head is rotated into an initial tape contact position;

f. variable delay means connected to said second transducer for imparting a selectively variable time delay to the second output signal, the total time delay imparted to said second output signal being no greater than the time separating said first and second output signals;

g. phase comparator means for determining the phase difference between signals applied thereto, said phase comparator means including a first input and a second input;

h. manually operable switch means operable during a signal recording operation to supply the phase comparator means with a signal synchronized with the frame frequency signal contained in a received video signal and to couple the first transducer to the phase comparator means, and operable during a signal reproducing operation in a first mode to couple the control signal magnetic head and the first transducer to the phase comparator, and being further operable during a signal reproducing operation in a second mode to couple the control signal magnetic head and the variably delayed second output signal to the phase comparator; and

i. phase control means for adjusting the driving phase of at least one of said driving means in accordance with the output signal produced by the phase comparator means.

3,958,272

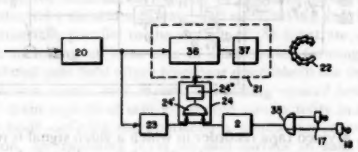
TURN AROUND METHOD AND CIRCUIT

Gerhard Rotter, Mission Viejo, Calif., and Ontje Arpe, Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation-in-part of Ser. No. 443,411, Feb. 19, 1974, abandoned. This application Feb. 14, 1975, Ser. No. 549,896

Int. Cl.² G11B 15/18, 15/44, 23/40

U.S. Cl. 360—74 6 Claims



1. In a tape video recorder wherein the video signal is recorded on a tape as a frequency modulated signal, including a tape transport apparatus of the type arranged to reverse the direction of tape movement within an extremely short period of time, and wherein the recording of at least video signals is continued while the reversing operation is performed, the improved turn around method comprising

a. recording of a high frequency signal in recording operation at the moment when the reversing operation of the transport is initiated, the frequency range of the high frequency signal having a predetermined range above the highest frequencies of the frequency modulated video signals;

b. detecting said high frequency signal as a dropout signal within a predetermined frequency range in playback operation;

c. identifying each dropout signal occurring within said predetermined frequency range in regard to its duration; and

d. deriving a control signal for initiating the reversal of tape movement if the length of the identified duration of said dropout signal is greater than a predetermined time interval.

3,958,273

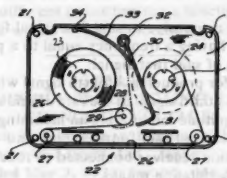
CASSETTE-TYPE HEAD DEMAGNETIZER

George Alexandrovich, Sr., Commack, and Art Seides, Jericho, both of N.Y., assignors to Robins Industries Corporation, Commack, N.Y.

Filed Aug. 23, 1974, Ser. No. 500,122

Int. Cl.² G11B 5/46, 5/41, 23/04

U.S. Cl. 360—128 8 Claims



1. A cassette-type demagnetizer for magnetic heads of tape-recording and/or playback units, comprising a housing having an open side adapted to be juxtaposed with a magnetic head of the unit; a rotatable tape supply hub and a rotatable tape take-up hub in said housing and engageable with drive spindles of the unit; a tape convoluted on said supply hub and adapted to be withdrawn from the same and convoluted onto said take-up hub in response to rotation of the latter; a circular permanent magnet; means for rotatably mounting said magnet in said housing adjacent said open side for rotation about a stationary axis so as to be located opposite the magnetic head of the unit, said tape being trained about said magnet to rotate the same as said tape is transferred to said take-up hub, so that an alternating magnetic field is produced for demagnetizing the head of the unit; and shielding means responsive to the transfer of said tape from said supply hub to said take-up hub, for progressively reducing said magnetic field to zero during such transfer.

DESIGN PATENTS

GRANTED MAY 18, 1976

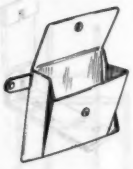
ERRATA

For CLASS	See PATENT NO.
034-005 GH	239,964

DESIGNS

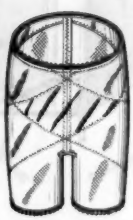
MAY 18, 1976

239,886
POCKET ATTACHABLE TO A STRAP OR SIMILAR ARTICLE
Lorraine Finch, 2106 Lapeer St., Flint, Mich.
Filed July 9, 1973, Ser. No. 377,555
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400

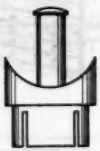


239,887
SPORT SHOE
Jonas Senter, Oakley Lane, Greenwich, Conn. 06830
Filed Feb. 12, 1974, Ser. No. 441,810
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

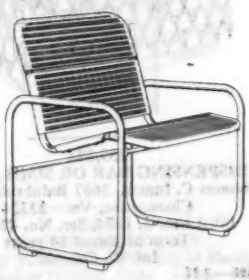
239,888
PANTY GIRDLE
Jack J. Lo Cascio, Bayonne, N.J., assignor to International Playtex, Inc., New York, N.Y.
Filed Oct. 3, 1974, Ser. No. 511,872
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—4



239,889
CHAIR CONNECTOR
Robert W. O'Halloran, 1146 Harrison St., Hollywood, Fla. 33020
Filed Dec. 7, 1972, Ser. No. 311,712
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



239,890
LOUNGE CHAIR
Tim M. Uyeda, South San Gabriel, Calif., assignor to Samsonite Corporation, Denver, Colo.
Filed Mar. 2, 1973, Ser. No. 337,461
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67

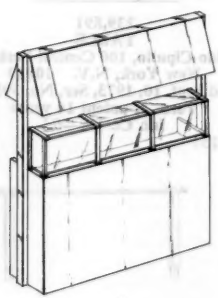


239,891
TABLE
Aldo Cipullo, 100 Central Park S., New York, N.Y. 10019
Filed Sept. 10, 1973, Ser. No. 395,413
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—151

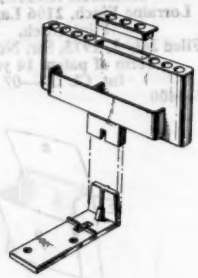
239,892
ROOM DIVIDER
Leonard Eisen, 14 Lomas Lane, Montvale, N.J. 07645
Filed Apr. 10, 1974, Ser. No. 459,808
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—164

239,893
DRESSER
Leonard Eisen, 14 Lomas Lane, Montvale, N.J. 07645
Filed Apr. 10, 1974, Ser. No. 459,809
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—154

239,894
FOOD DISPENSING BAR OR SIMILAR ARTICLE
Thomas C. Inman, 3607 Bainbridge Blvd., Chesapeake, Va. 23324
Filed June 5, 1974, Ser. No. 476,342
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—144

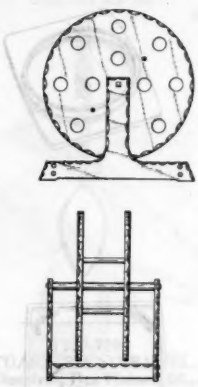


239,895
COLLAPSIBLE FILING CABINET
Kurt Bonnie Karl Axel Lundberg, Malarvagen 1, Box 5021, 141 05 Huddinge, Sweden
Filed June 7, 1974, Ser. No. 477,235
Claims priority, application Great Britain Dec. 11, 1973
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—167



239,896
COMBINED ART TOOL CADDY AND REMOVABLE HANDLE THEREFOR
Dallas R. Bottcher, 911 Cobblestone Drive, Lincoln, Nebr. 68510
Filed June 13, 1974, Ser. No. 478,908
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—189

239,897
WINE BOTTLE RACK
Lester E. Simon, 6650 Vernon Ave. S., Minneapolis, Minn. 55436, and James L. Phelps, 1740 Hampshire Road, St. Paul, Minn. 55116
Filed July 17, 1974, Ser. No. 489,379
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—188



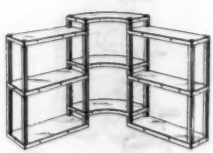
239,898
DRAWING TABLE BASE OR SIMILAR ARTICLE
Morris B. Kirshenbaum, Pittsburgh, and David N. Jones, Bridgeville, Pa., assignors to Ivy Arts Corporation
Filed Sept. 25, 1974, Ser. No. 509,442
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—196

239,899
MUSIC STAND
Frederick H. Malcolm, 2950 NE. 23rd St., Gresham, Oreg. 97030
Filed Oct. 31, 1974, Ser. No. 519,532
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—18

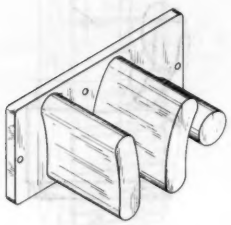
239,900
CHAIR
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Dec. 19, 1974, Ser. No. 534,179
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—71

239,901
CURVED SHELF UNIT
George V. Goulder, 2701 Eaton Road, Shaker Heights, Ohio 44118
Filed Jan. 2, 1975, Ser. No. 538,109
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186

239,902
CORNER SHELF UNIT
George V. Goulder, 2701 Eaton Road, Shaker Heights, Ohio 44118
Filed Jan. 2, 1975, Ser. No. 538,110
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186



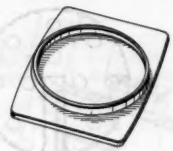
239,903
SKI AND SKI POLE HOLDER
James W. Donaldson, 8905 W. Bayaud Ave., Lakewood, Colo. 80226
Filed Jan. 8, 1975, Ser. No. 539,464
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—125



239,904
PICNIC TABLE
Orville R. Bohlmann, Box 344, Denison, Iowa 51442
Filed Feb. 24, 1975, Ser. No. 552,252
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—45

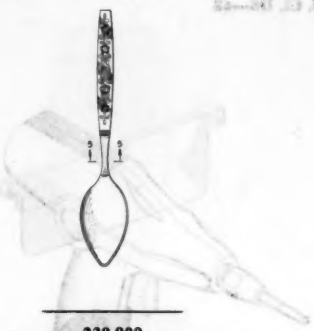
239,905
DISPLAY STAND
Samuel Grimaldo, 776 W. Sandoval, Thousand Oaks, Calif. 91360
Filed May 27, 1975, Ser. No. 580,957
Term of patent 14 years
Int. Cl. D6—*04*; D20—*02*
U.S. Cl. D6—24

239,906
LID FOR A WATER RESERVOIR TYPE COFFEE-MAKER OR SIMILAR ARTICLE
Max C. Hauenstein, Monroe, Conn., assignor to General Electric Company
Filed Feb. 27, 1974, Ser. No. 446,521
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—131

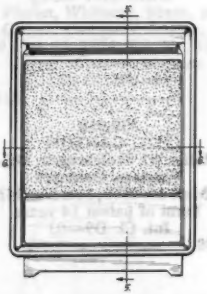


239,907
MEASURING SCOOP
Tage Olsson, Glumslov, Sweden, assignor to Konstruktionsfirman Telcoprodukter Tage Olsson AB, Glumslov, Sweden
Filed Apr. 4, 1974, Ser. No. 458,054
Claims priority, application Sweden Oct. 5, 1973
Term of patent 14 years
Int. Cl. D7—*99*; D10—*04*
U.S. Cl. D7—50

239,908
SPOON OR SIMILAR ARTICLE
Ellen B. Manderfield, Syracuse, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed May 28, 1974, Ser. No. 474,043
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137



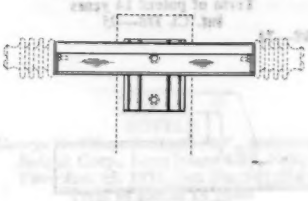
239,909
TOASTER END PANEL
Bernard B. Bluestein, Des Plaines, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed July 8, 1974, Ser. No. 486,707
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—91



239,910
PAIR OF SCISSORS
Salvatore J. Megna, Sacramento, Calif., assignor to Professional Instruments Incorporated, Cincinnati, Ohio
Filed Nov. 19, 1973, Ser. No. 417,041
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57

239,911
CLIP FOR WIRES OR THE LIKE
Bradley James Schmidt, East Dundee, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed May 17, 1974, Ser. No. 471,114
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—230

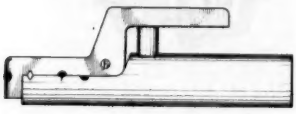
239,912
INSULATOR SUPPORT FOR UTILITY POLES
John E. Breeden, Royston, Ga., assignor to Hopeman Brothers, Inc., New York, N.Y.
Filed Sept. 30, 1974, Ser. No. 510,589
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—234



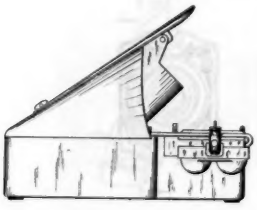
239,913
PULL KNOB
George D. Read, Glendora, Lawrence Glen McCain, Beverly Hills, and Edward William Scott, Culver City, Calif., assignors to Ajax Hardware Corporation, City of Industry, Calif.
Filed Oct. 15, 1974, Ser. No. 514,821
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—143

239,914
ADJUSTABLE CHAIN PIPE WRENCH
Carl M. Henry, 1956 Franklin Ave., Toledo, Ohio 43624
Filed Dec. 16, 1974, Ser. No. 533,288
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—32

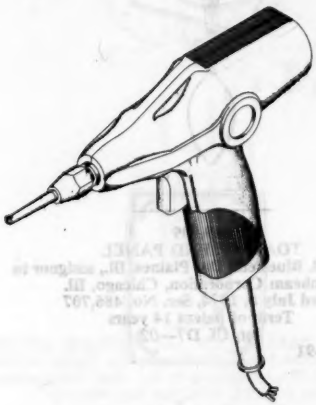
239,915
ARC WELDING ELECTRODE HOLDER
Charles G. Matthews, 1649 Semmes, Memphis, Tenn. 38114
Filed Feb. 3, 1975, Ser. No. 547,344
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71



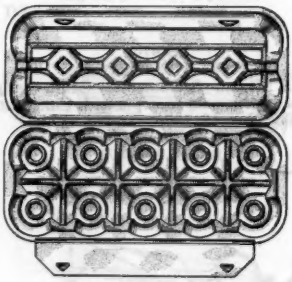
239,916
HOLDER FOR SOLDERING INSTRUMENT OR THE LIKE
William S. Fortune, 14250 Dearborn St., Panorama City, Calif. 91402
Filed May 5, 1975, Ser. No. 574,463
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71



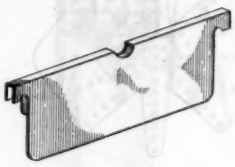
239,917
HAND-HELD POWER TOOL FOR EFFECTING ELECTRICAL CONNECTIONS
William J. Baker, Reed City, Walter N. Christiansen, Spring Lake, Richard J. Hurst, Hersey, and Robert W. Klemm, Reed City, Mich., assignors to Gardner-Denver Company, Dallas, Tex.
Filed May 9, 1975, Ser. No. 576,238
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—68



239,918
EGG CARTON
Bent Moller, 91 Skolekrogen, DK-3500 Vaerlose, Denmark
Filed Mar. 16, 1973, Ser. No. 341,935
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—190



239,919
COMBINED PACKAGING CARD AND HANGER FOR AN ARTICLE OF MERCHANDISE
Michael C. Wilson, Wheaton, Ill., assignor to Pretty Products, Inc., Coshocton, Ohio
Filed Jan. 15, 1974, Ser. No. 433,551
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—191

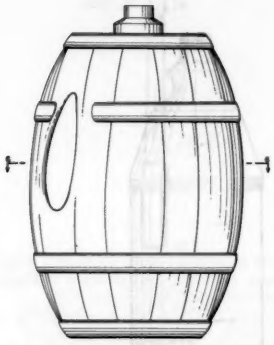


239,920
PACKAGING CONTAINER FOR A RAZOR OR THE LIKE
Carl H. Floren, Whitman, Mass., assignor to The Gillette Company, Boston, Mass.
Filed May 13, 1974, Ser. No. 469,595
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—186

239,921
BOTTLE
Harvey Carter Taylor, Decatur, and Michael W. J. Godden and Marshall J. Barrash, Atlanta, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Oct. 22, 1974, Ser. No. 516,851
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—100

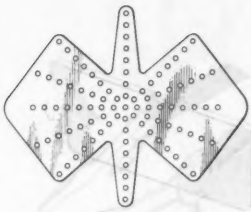
239,922
BOTTLE
George D. Utley, Bedford, N.Y., assignor to Relpak Corp., Long Island City, N.Y.
Filed Jan. 15, 1975, Ser. No. 541,324
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—159

239,923
BOTTLE
Lawrence C. Lynd, Columbus, Ohio, assignor to Ohio Container Company, Columbus, Ohio
Filed Mar. 12, 1975, Ser. No. 557,623
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—28

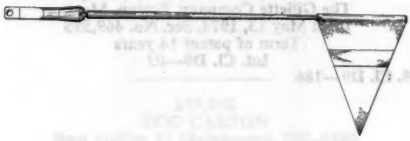


239,924
LIQUID CONCENTRATION METER
Iosif Ilich Elshansky, ulitsa Koshtoyantsa 1A, kv. 75, Moscow, U.S.S.R.
Filed Aug. 3, 1973, Ser. No. 385,582
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—84

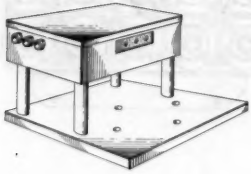
239,925
INSTRUMENT FOR GUIDING THE DRAWING OF DESIGNS
Morton P. Matthew, Kreiner Lane, R.F.D. 2, Norwalk, Conn. 06850
Filed Nov. 5, 1973, Ser. No. 412,753
Term of patent 14 years
Int. Cl. D10—*99*
U.S. Cl. D10—61



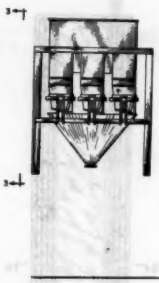
239,926
SAFETY FLAG
John B. Baker, P.O. Box 368, Issaquah, Wash. 98027
Filed June 7, 1974, Ser. No. 477,198
Term of patent 7 years
Int. Cl. D10—*06*
U.S. Cl. D10—109



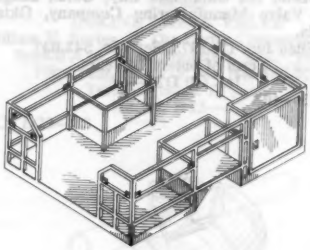
239,927
TRIMMING FIXTURE FOR PIEZOELECTRIC RESONATOR MEASURING APPARATUS
Alfred G. Staples, Evergreen, Va., assignor to General Electric Company, Lynchburg, Va.
Filed Sept. 17, 1974, Ser. No. 506,892
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—75



239,928
FILLING MACHINE WEIGHING STATION
Doyle R. Hudson, West Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.
Filed Feb. 10, 1975, Ser. No. 548,479
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—87

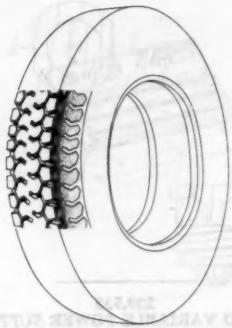


239,929
TRUCK BODY
Lloyd J. Hawkins, 14922 Coldwater Road, Fort Wayne, Ind. 46825
Filed Nov. 15, 1974, Ser. No. 524,206
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—98



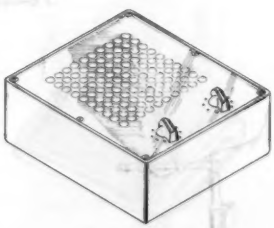
239,930
HELICOPTER
Harold D. Ulisnik, Trumbull, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Dec. 18, 1974, Ser. No. 533,896
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—73

239,931
TIRE
Ethel L. Duncan, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company
Filed Dec. 23, 1974, Ser. No. 535,898
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

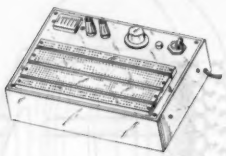


239,932
REARVIEW MIRROR
Myung S. Kim, 2900 Knights Road, Room B–15, Cornwell Heights, Pa. 19020
Filed Mar. 12, 1975, Ser. No. 557,588
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—187

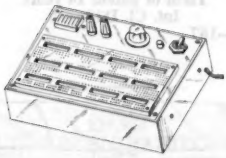
239,933
ELECTRIC TIMES TABLE TEACHING INSTRUMENT
James F. Champaigne, 1011 Golfview Lane, South Bend, Ind. 46614
Filed Aug. 22, 1974, Ser. No. 499,517
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—60



239,934
COMBINED VARIABLE POWER SUPPLY AND CIRCUIT TESTER DEMONSTRATION UNIT
Joseph Don Jack, 314 Warren St., Harrison, N.J. 07029
Filed Mar. 24, 1975, Ser. No. 561,060
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62

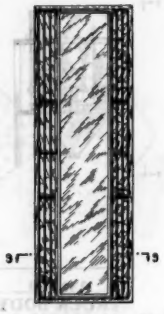


239,935
COMBINED VARIABLE POWER SUPPLY AND CIRCUIT TESTER DEMONSTRATION UNIT
Joseph Don Jack, 314 Warren St., Harrison, N.J. 07029
Filed Mar. 24, 1975, Ser. No. 561,061
Term of patent 7 years
Int. Cl. D19—*07*
U.S. Cl. D19—62



239,936
RIFLE HOLDER
Bill Royce Garlington, 2238 S. Piney Point Road 201, Houston, Tex. 77042
Filed Feb. 10, 1975, Ser. No. 548,258
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13

239,937
INSECT ELECTROCUTOR
Donald E. Gilbert, Box 2188, Jonesboro, Ark. 72401
Filed Apr. 10, 1975, Ser. No. 566,691
Term of patent 7 years
Int. Cl. D22—*06*
U.S. Cl. D22—19



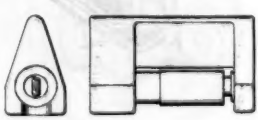
239,938
VALVE RECEIVING TUBING FITTING
John W. Olson, Jr., Oklahoma City, Okla., assignor to C & D Valve Manufacturing Company, Oklahoma City, Okla.
Filed Jan. 17, 1975, Ser. No. 542,037
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40

239,939
AIR INDUCTOR
David Anthony Whitbread, Luton, England, assignor to F. Brauer Limited, Hertfordshire, England
Filed May 20, 1974, Ser. No. 471,201
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—151

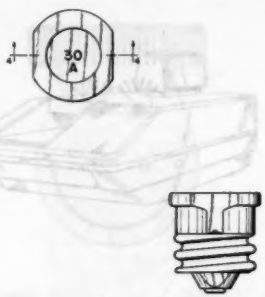
239,940
AIR CIRCULATING DEVICE
David A. Martin, 4872 Wembley Place, Beaverton, Oreg. 97005
Filed Oct. 25, 1974, Ser. No. 517,911
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—160

239,941
IN-LINE CHECK VALVE
William V. Porter, % The Porter Company, 1620 S. Seguin Ave., New Braunfels, Tex. 78130
Filed Mar. 21, 1975, Ser. No. 560,578
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—22

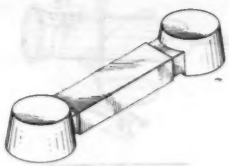
239,942
DENTAL HANDPIECE WRENCH
Wolfgang O. Junkel, Mount Prospect, Ill., assignor to American Hospital Supply Corporation
Filed June 21, 1974, Ser. No. 481,510
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1 D



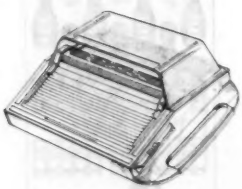
239,943
FUSE
Frederic W. Schwartz, 338 Rochambeau Ave., Providence, R.I. 02906
Filed Nov. 20, 1974, Ser. No. 525,494
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 D



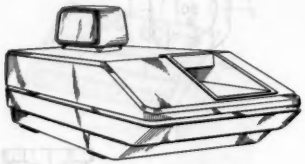
239,944
INSULATOR FOR BATTERY TERMINALS CONNECTOR
Henry E. Jensen, Lafayette Hill, and Franz M. Wagner, Lansdale, Pa., assignors to Eltra Corporation, Toledo, Ohio
Filed Dec. 12, 1974, Ser. No. 532,136
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D26—1 A



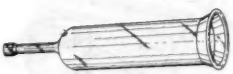
239,945
MANUAL CARD PUNCH APPARATUS
Peter P. Klepa, Los Angeles, Calif., assignor to Data Entry Systems
Filed Oct. 9, 1973, Ser. No. 404,402
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



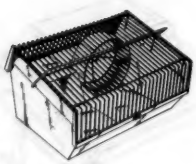
239,946
ELECTRONIC MACHINE FOR USE IN DOCUMENT PROCESSING
Robert L. Greene, Diamond Bar, and Lorin P. Olson, Tustin, Calif., assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio
Filed Aug. 1, 1974, Ser. No. 493,492
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



239,947
CIGARETTE HOLDER
Charles W. Frost, 7800 Wisconsin Ave., Washington, D.C. 20014
Filed May 14, 1974, Ser. No. 469,759
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—7



239,948
CAGE FOR SMALL DOMESTIC ANIMALS
Roy Frederick Perkins, Reigate, Surrey, England, assignor to Genyk Products Limited, Mitcham, England
Filed Feb. 10, 1975, Ser. No. 548,713
Claims priority, application Great Britain Aug. 12, 1974
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1

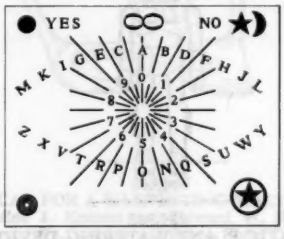


239,949
GAME TARGET OR SIMILAR ARTICLE
Tito Trombetto, Jr., 40 Lawrence St., Danvers, Mass. 01923
Filed Apr. 16, 1973, Ser. No. 351,788
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 PP

239,950
CHESS PIECE SET FOR CHINESE CHESS
Wah J. Sheck, Rockville, Md., assignor to Gemini Products, Inc., Wheaton, Md.
Filed July 27, 1973, Ser. No. 383,112
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CH

239,951
GOLF PUTTER HEAD
Raymond E. Carrier, 1017 N. Lake St., Burbank, Calif. 91502
Filed May 13, 1974, Ser. No. 469,224
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

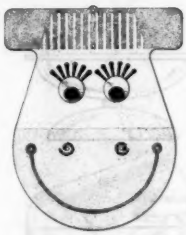
239,952
GAME BOARD
Barbara G. Burwell, P.O. Box 14, Woods Hole, Mass. 02543, and Joy Dory, Peterborough, N.H. (Darling Hill Road, Mason, N.H. 03048)
Filed Nov. 22, 1974, Ser. No. 526,338
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



239,953
PLAYGROUND ROUNDABOUT
Ronald W. Zick, Minneapolis, Minn., assignor to The Toro Company, Minneapolis, Minn.
Filed Feb. 10, 1975, Ser. No. 548,179
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 G

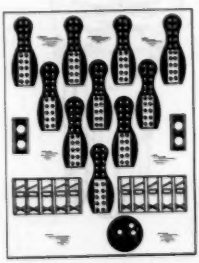
239,954
DECORATIVE HEAD FOR PLAYGROUND EQUIPMENT
Ronald W. Zick, Minneapolis, Minn., assignor to The Toro Company, Minneapolis, Minn.
Filed Feb. 10, 1975, Ser. No. 548,553
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 L

239,955
STEER HEAD FOR PLAYGROUND EQUIPMENT
Ronald W. Zick, Minneapolis, Minn., assignor to The Toro Company, Minneapolis, Minn.
Filed Feb. 10, 1975, Ser. No. 548,554
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 L

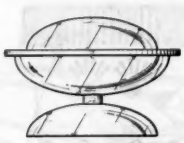


239,956
PLAYGROUND ROCKER
Ronald W. Zick, Minneapolis, Minn., and Ronald L. Ewers, Litchfield, Mich., assignors to The Toro Company, Minneapolis, Minn.
Filed Feb. 18, 1975, Ser. No. 550,868
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 D

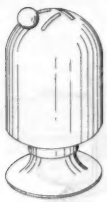
239,957
BOWLING SCOREBOARD
John T. Linton, 43 Bond St., Dayton, Ohio 45405
Filed Mar. 10, 1975, Ser. No. 556,732
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 MM



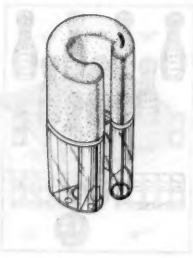
239,958
COIN BANK
Tony Robert, 5701 Southwest Freeway, Houston, Tex. 77057
Filed May 1, 1974, Ser. No. 465,813
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D34—11 R



239,959
TOY BANK
Sadayasu Miyazaki, 7–9–10 Tateishi Katsushika-ku, Tokyo, Japan
Filed Jan. 6, 1975, Ser. No. 538,859
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D34—11 R

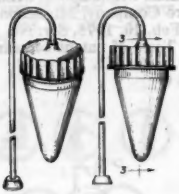


239,960
BANK
Sadayasu Miyazaki, 7–9–10 Tateishi Katsushika-ku, Tokyo, Japan
Filed Jan. 6, 1975, Ser. No. 538,863
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D34—11 R

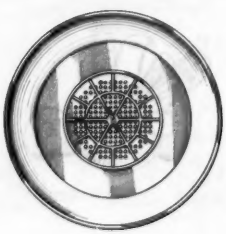


239,961
DOLL TOY
Naoharu Yamashina, 4–14 Komagata 1-chome, Taito-ku, Tokyo, Japan
Filed June 20, 1974, Ser. No. 481,326
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AD

239,962
AUTOMATIC PLANT WATERING DEVICE OR SIMILAR ARTICLE
Paul S. Von Till, 115 Standford Ave., Colonia, N.J. 08817
Filed Mar. 20, 1974, Ser. No. 452,682
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 R

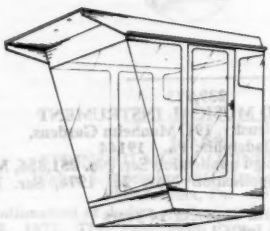


239,963
FLORAL TRAY
Robert H. C. M. Daenen, Erembodegem, and Pieter K. J. De Coster, Aalst, Belgium, assignors to Dart Industries Inc., Los Angeles, Calif.
Filed July 29, 1974, Ser. No. 492,804
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 R

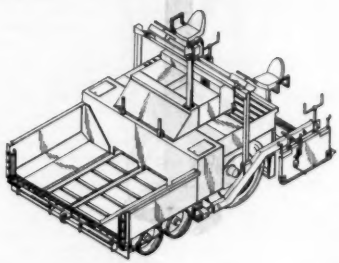


239,964
METAL GOLF CLUB HEAD
Richard C. Wilson, Arcadia, Calif., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Aug. 27, 1974, Ser. No. 500,678
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

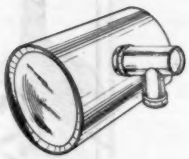
239,965
CAB FOR A HARVESTING MACHINE
Constantine J. Kermes and Edward W. Rowland-Hill, Lancaster, Pa., assignors to Sperry Rand Corporation
Filed Jan. 2, 1974, Ser. No. 430,129
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 E



239,966
ASPHALT LAYDOWN MACHINE
George W. Swisher, Jr., Oklahoma City, Don W. Smith, Edmond, and Gary L. Westphall, Oklahoma City, Okla., assignors to CMI Corporation
Filed Nov. 25, 1974, Ser. No. 526,536
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D40—5



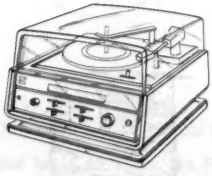
239,967
FLOODLIGHT
Robert Lowell Ewing, Newark, Ohio, and Mitchell Bobrick, Redondo Beach, Calif., assignors to Johns-Manville Corporation, Denver, Colo.
Filed Apr. 25, 1974, Ser. No. 463,931
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—20 K



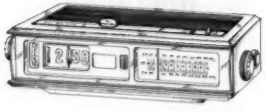
239,968
HOLDER FOR PATIO TORCH
William V. McNamara, Chicago, Ill., assignor to Bell Chemical Company
Filed Sept. 23, 1974, Ser. No. 508,555
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 R

239,969
POST TOP LUMINAIRE UTILITY POLE
William J. Whatley, 2069 S. Macon Way, Aurora, Colo. 80232
Filed Nov. 21, 1974, Ser. No. 525,921
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

239,970
COMBINED PHONOGRAPH AND TUNER
Melvin H. Boldt, Glenview, and David P. Chuboff, North Barrington, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.
Filed May 23, 1974, Ser. No. 472,747
Term of patent 7 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R



239,971
CLOCK RADIO
Leonard Kaye, Westfield, N.J., assignor to Capehart Corporation, New York, N.Y.
Filed Nov. 14, 1974, Ser. No. 523,840
Term of patent 14 years
Int. Cl. D10—*01;* D14—*03*
U.S. Cl. D56—4 B



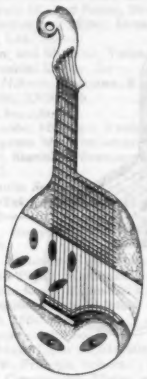
239,972
STRINGED MUSICAL INSTRUMENT
Walter J. Pelensky, 19C Manheim Gardens, Philadelphia, Pa. 19144
Continuation of design application Ser. No. 253,920, May 16, 1972. This application Nov. 25, 1974, Ser. No. 527,129
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

239,973
STRINGED MUSICAL INSTRUMENT
Walter J. Pelensky, 19C Manheim Gardens, Philadelphia, Pa. 19144
Continuation of design application Ser. No. 251,856, May 9, 1972. This application Nov. 25, 1974, Ser. No. 527,130
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

239,974
STRINGED MUSICAL INSTRUMENT
Walter J. Pelensky, 19C Manheim Gardens, Philadelphia, Pa. 19144
Continuation of design application Ser. No. 256,206, May 23, 1972. This application Nov. 25, 1974, Ser. No. 527,131
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

239,975
STRINGED MUSICAL INSTRUMENT
Walter J. Pelensky, 19C Manheim Gardens, Philadelphia, Pa. 19144
Continuation of design application Ser. No. 251,857, May 9, 1972. This application Nov. 25, 1974, Ser. No. 527,132
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

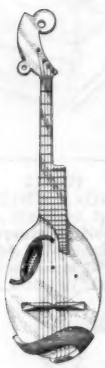
239,976
STRINGED MUSICAL INSTRUMENT
Walter J. Pelensky, 19C Manheim Gardens, Philadelphia, Pa. 19144
Filed Nov. 25, 1974, Ser. No. 527,133
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A



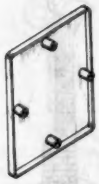
239,977
STRINGED MUSICAL INSTRUMENT
Walter J. Pelensky, 19C Manheim Gardens, Philadelphia, Pa. 19144
Filed Nov. 25, 1974, Ser. No. 527,134
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

239,978
STRINGED MUSICAL INSTRUMENT
Walter J. Pelensky, 19C Manheim Gardens, Philadelphia, Pa. 19144
Filed Nov. 25, 1974, Ser. No. 527,135
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

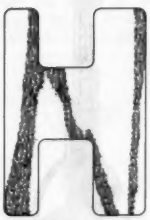
239,979
STRINGED MUSICAL INSTRUMENT
Walter J. Pelensky, 19C Manheim Gardens, Philadelphia, Pa. 19144
Filed Nov. 25, 1974, Ser. No. 527,136
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A



239,980
PHOTOGRAPH MOUNT
Jan Irvin Parson, Santa Ana, Calif. (460 Abbie Way, Costa Mesa, Calif. 94527)
Filed June 13, 1974, Ser. No. 478,865
Term of patent 7 years
Int. Cl. D16—*99*
U.S. Cl. D61—1 S



239,981
ORTHOPEDIC BRACE
Elmer Arluck, New York, N.Y., and Myron S. Jenner, Bethel, Vt., assignors to Thermo-Mold Medical Products, Inc., New York, N.Y.
Filed July 30, 1974, Ser. No. 493,129
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 J



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF MAY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See—*
Beard, Lloyd Ronald; and Knepper, Allen Houpt, 3,958,205.

A. B. Grona & Company KB: *See—*
Ingestrom, Irma Ulla Birgitta, 3,956,859.

A. C. Aukerman Co.: *See—*
Goughnour, Roy R., 3,957,405.

A. Stephan u. Sohne: *See—*
Otto, Friedrich; Tilch, Heinrich; Kollner, Friedrich; and Rogalski, Manfred, 3,957,215.

A. Stuck, Company: *See—*
Wiebe, Donald, 3,957,318.

AB Gotaverken: *See—*
Johansson, Kurt, 3,957,240.

AB Krima Maskinfabrik: *See—*
Berggren, Torsten Lennart, 3,957,214.

Abbott Laboratories: *See—*
Stried, Gene Alan; and Sesin, Peter George, 3,957,582.

Abegg, Jean-Louis: *See—*
Kalopissis, Gregoire; Abegg, Jean-Louis; Ghilardi, Guiliana; and de Beaulieu, Henri Philippe, 3,957,774.

Abel, Martin L., to Permalock Company, Inc. Cutter for non-woven carpet machine. 3,957,568, Cl. 156-510.000.

Aber, Henry S.; Riggs, Dean D.; and Lamantia, John, to Water Technology Service, Inc. Water treatment device with transistorized circuit. 3,957,617, Cl. 204-305.000.

Acco International Inc.: *See—*
Rose, Allen J., 3,957,321.

ACI Technical Centre Pty. Ltd.: *See—*
Gault, John Robert, 3,957,407.

Acorn Engineering Company, Inc.: *See—*
Morris, Earl L.; and Fields, Larry D., 3,957,241.

Adachi, Keiichi: *See—*
Masuda, Takao; and Adachi, Keiichi, 3,957,493.
Ohi, Reiichi; Adachi, Keiichi; Katoh, Norihiko; Kameoka, Kimitaka; Sugiyama, Mitsunori; and Aono, Toshiaki, 3,957,491.

Adachi, Shichiro; and Miyakoshi, Toshinobu, to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha (Tokyo Electronics Co., Ltd.). Catalyst for treating exhaust gas from engine vehicles. 3,957,691, Cl. 252-465.000.

Adams, David Orin, to United Technologies Corporation. Fluidically controlled cargo hook controlled system. 3,957,233, Cl. 244-137.00R.

Adams, David Orin: *See—*
Mulvey, William Joseph; Adams, David Orin; and Sivigny, Arthur Lawrence, 3,957,234.

Adams, Ernest Clarence; and Teeter, Howard Raymond, to Miles Laboratories, Inc. Passive hemagglutination test method and composition for use therein. 3,957,435, Cl. 23-230.00B.

Adams, Herbert J. F.; and Takman, Bertil H., to Astra Pharmaceutical Products, Inc. Pharmaceutical local anesthetic compositions. 3,957,996, Cl. 424-253.000.

Adams, Stewart Sanders; Armitage, Bernard John; Bristow, Norman William; and Heathcote, Bernard Vincent, to Boots Company Limited, The. Xanthenyl semicarbazides. 3,957,821, Cl. 260-335.000.

Addressograph Multigraph Corporation: *See—*
Croft, George Thomas, 3,957,365.

Adin, Anthony, to Eastman Kodak Company. Photographic element containing a photoreducible salt of an aryl hydroxy-carboxy anion and a tetrazolium cation and the use thereof. 3,957,514, Cl. 96-48.00R.

Adrian, Donald J., to United States of America, Navy. Chaff discrimination system. 3,958,241, Cl. 343-7.0PF.

AEG-Elotherm G.m.b.H.: *See—*
Stengel, Edgar, 3,957,257.

Aeronutronic Ford Corporation: *See—*
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Anderson, Joel M.; Wescott, Kermit R.; Hobbs, Milton M.; and Kiscaden, Roy W., to Westinghouse Electric Corporation. Smooth and highly responsive gas turbine temperature limit control especially useful in combined cycle electric power plants. 3,956,883, Cl. 60-39.140.
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Arkell, Alfred; and Crone, John M., Jr., to Texaco Inc. Hydroalkylation catalyst and process. 3,957,687, Cl. 252-455.00R.
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Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., to BASF Wyandotte Corporation. Process for preparing an oxyalkylated product and reaction product thereof. 3,957,922, Cl. 260-921.000.
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Baldi, Alfonso L., to Alloy Surfaces Co., Inc. Diffusion treatment of metal. 3,958,047, Cl. 427-252.000.

Baldwin, Mart G., to United States of America, Army. Low signature propellants based on acrylic prepolymer binder. 3,957,549, Cl. 149-19.910.

Ball, Eric, to Dunlop Holdings Limited. Flexible articles. 3,957,085, Cl. 138-129.000.

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Bandurick, Donald J., to United Technologies Corporation. Turbine disk and sideplate construction. 3,957,393, Cl. 416-220.00R.

Barabas, Miklos F., to Saskatchewan Power Corporation. Space heating using off-peak electric heat storage. 3,958,101, Cl. 219-365.000.

Barber, Ronald O.; and Barnes, Daniel J., to Magnavox Company, The. Compatible 4-2-4 encoding-decoding system. 3,958,085, Cl. 179-1.0GQ.

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Barnes, Daniel J.: *See—*
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Barton, Robert W.; Cannizzaro, Joseph A.; and Kise, Mearl A., to Virginia Chemicals Inc. Apparatus for aqueous solutions of pure sodium hydrosulfite. 3,957,253, Cl. 259-8.000.

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Bateman, Charles Donald, to Sundstrand Data Control, Inc. Aircraft ground proximity warning system with speed compensation. 3,958,218, Cl. 340-27.00R.

Bateman, Charles Donald; and Muller, Hans Rudolf, to Sundstrand Data Control, Inc. Terrain closure warning system with altitude rate signal conditioning. 3,958,219, Cl. 340-27.00R.

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Bauer, Victor J.; and Ong, Helen H., to American Hoechst Corporation. 3-Aminoalkyl-1,3-dihydro-3-phenylspiro[isobenzofurans]. 3,957,828, Cl. 424-283.000.

Baumgartner, Herman J., to Shell Oil Company. Cyclic polymerization process. 3,957,914, Cl. 260-880.00B.

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Bavetz, James W. Furnace wall assembly having reduced thermal conductivity. 3,956,998, Cl. 110-1.00A.

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Bustard, Thomas Stratton; and Goslee, David Earl, to Nuclear Battery Corporation. Implantable thermoelectric generator having thermopile compression wires. 3,957,541, Cl. 136-205.000.

Butterworth, Elbert Roy, to Johns-Manville Corporation. Increasing the chill haze stability of aqueous liquids derived from fruits and vegetables. 3,958,023, Cl. 426-271.000.

Button, Edward F.: *See—*
Hokanson, Allan E.; Katzen, Raphael; and Button, Edward F., 3,957,951.

Buyssens, Noel; Davidts, Jan; and Nottebaere, Arseen, to N.V. Bekaert S.A. Reinforcing fabrics. 3,957,091, Cl. 139-425.00R.

Buzbee, Lloyd R.; and Lake, Robert D., to Koppers Company, Inc. Chemically resistant polyester resins compositions. 3,957,906, Cl. 260-861.000.

Byk Gulden: *See—*
Klemm, Kurt; Schoetensack, Wolfgang; and Prusse, Wolfgang, 3,957,786.

C. Jim Stewart & Stevenson, Inc.: *See—*
Whiteman, Jack, 3,957,079.

Cabestany, Jean; and Schaffer, Erich, to Nobel Hoechst Chimie. Process of production of water-soluble linear polymers of very high molecular weight. 3,957,739, Cl. 526-207.000.

Cairns, James Anthony; Holdoway, Michael Joseph; Nelson, Robert Livingston; and Nelson, Richard Stuart, to United Kingdom Atomic Energy Authority. Method of preparing a catalyst. 3,957,692, Cl. 252-465.000.

Calabrese, Anthony, to Charles Greiner & Company. Cervical brace. 3,957,040, Cl. 128-75.000.

Calcagno, Piero; and Garetti, Enzo, to CSELT - Centro Studi e Laboratori Telecommunicazioni SpA. Telephone-signal receiver for switching exchanges having centralized logic circuits. 3,958,086, Cl. 179-15.0BY.

California Institute of Technology: *See—*
Rembaum, Alan; Yen, Shiao-Ping Siao; and Dreyer, William J., 3,957,741.

Calspan Corporation: *See—*
Wohlers, Robert J.; and Andre, Stephen N., 3,958,246.

Calzaturificio Giuseppe Garbuio S.A.S.: *See—*
Guolo, Giuseppe, 3,956,796.

Cameron Iron Works, Inc.: *See—*
Jones, Marvin R.; and Helfer, Paul E., 3,957,113.

Campbell, Gaylord K. Chocks. 3,957,237, Cl. 248-1.000.

Camps Mestre, Don Jose Maria; and Tremoleda Dilmer, Don Manuel. Mouthpieces to facilitate giving up smoking. 3,957,064, Cl. 131-171.00A.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Fairweather, Michael J.; and Topping, John A., 3,957,538.

Canadian Patents and Development Limited: *See—*
McLean, Paul Douglas; and Scott, Robert Frederick, 3,957,727.

Cannizzaro, Joseph A.: *See—*
Barton, Robert W.; Cannizzaro, Joseph A.; and Kise, Mearl A., 3,957,253.

Canon Kabushiki Kaisha: *See—*
Goshima, Yoshitomo; Hattori, Hiroyuki; Komaba, Shiro; and Umezawa, Kazumi, 3,957,368.
Nagasaka, Wataru, 3,958,260.
Yamada, Katsuhiko; and Iida, Toshihide, 3,957,016.

Capper, Harry Milton; and Broske, William Franklin, to AMP Incorporated. Explosively propelled equal mass tubular member swaging tool. 3,956,815, Cl. 29-421.00E.

Cappotto, Samuel D., to SCM Corporation. Impression control apparatus for typewriters. 3,957,150, Cl. 197-17.000.

Cardinal of Adrian, Inc.: *See—*
Papsdorf, John W., 3,957,188.
Papsdorf, John W., 3,957,189.

Carl Zeiss-Stiftung: *See—*
Kriese, Manfred; Kuhl, Jurgen; Neumann, Siegfried; and Torge, Reimund, 3,957,374.

Carlomagno, Giovanni Maria; Cecere, Antonio; Costa, Bruno; Muni, Nicola; and Napolitano, Luigi, to Italsider S.p.A. Nozzles of the lance heads for blowing oxygen from above in the refining processes. 3,957,258, Cl. 266-225.000.

Carmignani, Garibaldi M.; McCarty, James C.; and Monaco, George, to Syntex (U.S.A.) Inc. Contaminant filter in a closed-loop aquaculture system. 3,957,017, Cl. 119-3.000.

Carnes, Don A. Slidably mounted closet structure. 3,956,780, Cl. 4-173.00R.

Carpano & Pons S.A.: *See—*
Chauvigne, Michel, 3,957,244.

Carpenter, Norman F.: *See—*
Alexander, George B.; and Carpenter, Norman F., 3,957,529.

Carr, Albert A.; Fleming, Robert W.; and Sill, Arthur D., to Richardson-Merrell Inc. Antiviral compositions containing bis-basic esters and amides of xanthene and xanthone. 3,957,986, Cl. 424-248.000.

Carrico, John Paul, to Bendix Corporation, The. Pressure sensors utilizing ferromagnetic fluids. 3,956,938, Cl. 73-398.00R.

Carson, John Robert, to McNeil Laboratories, Incorporated. Preparation of pyrrole-2-acetic acid derivatives. 3,957,818, Cl. 260-326.200.

Carter, John W.: *See—*
Koutsky, L. John; and Carter, John W., 3,957,304.

Carter, Spencer Douglas: *See—*
Gastrock, William Henry; Pankavich, John Anthony; and Carter, Spencer Douglas, 3,957,978.

Carter, Thomas S.: *See—*
Johnson, Edwin O.; and Carter, Thomas S., 3,957,201.

Casagrande, Fulvio: *See—*
Leone, Luigi; and Casagrande, Fulvio, 3,958,026.

Casas, Raul E.: *See—*
Markle, David A.; Buckley, Jere D.; and Casas, Raul E., 3,957,364.

Case, Arthur L.; and Davidson, Jackson B., to United States of America, Energy Research and Development Administration. Real time, TV-based, point-image quantizer and sorter. 3,958,079, Cl. 178-6.800.

Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 3,957,151.
Kashio, Toshio, 3,958,252.

Cassan, Fernand Marcel, to Universal Oil Products Company. Flavoring and fragrance compositions. 3,957,745, Cl. 260-125.000.

Cassatta, Joseph C.: *See—*
Dickie, Ray A.; and Cassatta, Joseph C., 3,957,918.

Casse, Marcel. Roller fabric fulling machine. 3,956,806, Cl. 26-20.000.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*
Ribka, Joachim; and Schon, Manfred, 3,957,756.
von Brachel, Hanswilli; Heinrich, Ernst; Grawinger, Otto; Hintermeier, Karl; and Kindler, Horst, 3,957,749.

Cassidy, Edward L., Sr., to Alamance Industries, Inc. Control top panty hose and method of knitting same. 3,956,906, Cl. 66-42.000.

Castelli, Joseph L. Plate separator for fluid mixtures. 3,957,656, Cl. 210-521.000.

Caterpillar Tractor Co.: *See—*
Blackburn, Ronald Blaine, 3,957,392.
Cummins, Curtis Farris; and Kelly, Kenneth Wayne, 3,957,315.

Engel, Simon L., 3,957,339.
Evenson, Robert E., 3,956,835.
Hein, Allyn J., 3,956,969.

Catlin, Robert T.; Dawson, Chester H.; and Haskell, Philip R., to Remington Arms Company, Inc. Flexible hand held abrading tool. 3,956,858, Cl. 51-393.000.

Cav-Pro, Inc.: *See—*
Latimer, Floyd E., 3,958,036.

Cavier, Raymond: *See—*
Rossignol, Jean-Francois; and Cavier, Raymond, 3,957,812.

Cavitron Corporation: *See—*
Perdreaux, Rene J., Jr., 3,956,826.

CBS Inc.: *See—*
Fields, Grover G., 3,956,962.

Ceausescu, Ion; Constantinescu, Petre; Oachis, Emil; and Cristea, Nicolae, to Intreprinderea Metalui Rosu Cluj. Air and soil treatment apparatus for a greenhouse. 3,956,852, Cl. 47-17.000.

Cecere, Antonio: *See—*
Carlomagno, Giovanni Maria; Cecere, Antonio; Costa, Bruno; Muni, Nicola; and Napolitano, Luigi, 3,957,258.

Cedar Sales Company: *See—*
Johnson, John A., 3,956,871.
Johnson, John A., 3,956,872.

Celanese Coatings & Specialties Company: *See—*
Powanda, Thomas M.; Patella, Ralph F.; and Kuzma, Edward J., 3,957,711.

Celanese Corporation: *See—*
Thigpen, Hubert H.; Taylor, Wallace E.; and Schnizer, Arthur W., 3,957,873.

Centofanti, Armando P. Rotating parachute. 3,957,235, Cl. 244-152.000.

Central Specialties Co.: *See—*
Ballenger, Robert J., 3,956,842.

Centre d'Etudes pour l'Industrie Pharmaceutique: *See—*
Jacquier, Robert R., 3,957,789.

Chaki, Tomohiro: *See—*
Akutsu, Shoji; Watanabe, Yasumasa; Mashino, Yasuhiko; Chaki, Tomohiro; and Fujita, Masakazu, 3,958,128.

Chamberlain, Richard Earl: *See—*
Swartz, George Allan; and Chamberlain, Richard Earl, 3,956,820.

Chambers, Richard F., to GAF Corporation. Control of dye migration by treating textile with aqueous dye bath containing an amide derivative of polyvinyl methyl ether/maleic anhydride. 3,957,427, Cl. 8-62.000.

Champion International Corporation: *See—*
Gaylord, Norman G., 3,958,069.

Chapman, Charles C., to Phillips Petroleum Company. Indirect heat exchange in alkylation. 3,957,901, Cl. 260-683.430.

Chapman, John Edward, to Babcock & Wilcox Limited. Tool holding and positioning device. 3,956,810, Cl. 29-200.00P.

Chapman, William L., to Continental Oil Company. Two-wire multiplex seismic recording system. 3,958,216, Cl. 340-15.5QC.

Chappell, Charles Wilbur: *See—*
Young, Gerald Alfred; Thompson, Hugh Ansley; and Chappell, Charles Wilbur, 3,956,923.

Charles Greiner & Company: *See—*
Calabrese, Anthony, 3,957,040.

Charmakadze, Revaz Alexandrovich; Chikovani, Rafael Iraklievich; and Alferov, Zhores Ivanovich. Semiconductor light-emitting diode and method for producing same. 3,958,265, Cl. 357-17.000.

Charpentier, Jean G., to Societe Anonyme dite: S.I.E.T.A.M. Door opening mechanism for rotating drum. 3,957,254, Cl. 259-89.000.

Charsky, Ronald S.; Conn, Gilbert E.; Flamholz, Alexander L.; and Young, Harold J., to International Business Machines Corporation. Measuring method and system using a diffraction pattern. 3,957,376, Cl. 356-106.00R.

Chase, Wendell D., to United States of America, National Aeronautics and Space Administration. Vehicle simulator binocular multiplanar visual display system. 3,956,833, Cl. 35-12.00N.

Chaskin, Harold. Marine propeller mounting device. 3,957,394, Cl. 416-244.00B.

Chassaing, Jean. Ophthalmological device useful for eye surgery. 3,957,035, Cl. 128-2.00T.

Chauvigne, Michel, to Carpano & Pons S.A. Valve. 3,957,244, Cl. 251-30.000.

Chechakli, Hysam: *See—*
Himes, James B.; Chechakli, Hysam; and Beranek, Irvin A., 3,956,921.

Chem-Farm, Inc.: *See—*
English, J. L., 3,956,999.

Chemical Systems Incorporated: *See—*
Kesting, Robert E., 3,957,651.

Cherenko, Joseph P.; and Shaw, Hugh E., Jr., to PPG Industries, Inc. Antenna windshield. 3,958,245, Cl. 343-713.000.

Chevron Research Company: *See—*
Edwards, Laroy H., 3,958,000.
Franke, Hans G., 3,957,928.

Chicago Lock Co.: *See—*
Broska, John S., 3,956,912.

Chien, James C. W.; and Schappell, Frederick George, to Hercules Incorporated. Brominated azido fire retardants. 3,957,835, Cl. 260-349.000.

Chiesa, Peter J., Jr., to Philadelphia Suburban Corporation. Fire fighting. 3,957,657, Cl. 252-3.000.

Chiesa, Peter J., Jr.; and Di Maio, Louis R., to Philadelphia Suburban Corporation. Fire fighting. 3,957,658, Cl. 252-3.000.

Chikovani, Rafael Iraklievich: *See—*
Charmakadze, Revaz Alexandrovich; Chikovani, Rafael Iraklievich; and Alferov, Zhores Ivanovich, 3,958,265.

Chinook Chemicals Corporation Limited: *See—*
Bisset, Douglas M.; and Mercer, Colin, 3,957,884.

Chiou, Charles; Galli, Guido; Loeffler, Karl H.; and Lorenz, Max R., to International Business Machines Corporation. Ink jet nozzle structure. 3,958,255, Cl. 346-140.00R.

Chisum, Gloria T., to United States of America, Navy. Custom fitted, light weight, air conditioned protective helmet. 3,956,773, Cl. 2-6.000.

Chivinsky, Joseph A., to Allegheny Ludlum Industries, Inc. Pressure bonded composite material with low yield strength. 3,956,809, Cl. 29-196.100.

Chodnekar, Madhukar Subraya; Schwieter, Ulrich; Loeliger, Peter; Pfiffner, Albert; Suchy, Milos; and Zurfluh, Rene, to Hoffmann-La Roche Inc. Phenyl derivatives. 3,957,763, Cl. 260-240.00R.

Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, to Hoffmann-La Roche Inc. Alkynyloxy-phenyl derivatives. 3,957,833, Cl. 260-348.00R.

Christiansen, Kurt: *See—*
Kunz, Max; and Christiansen, Kurt, 3,957,075.

Christianson, Clinton C.; and Bourke, Robert F., to Gould Inc. Power converter employing non-saturating interphase transformer. 3,958,173, Cl. 321-45.00C.

Christl, Klaus, to J. Bobst & Fils S.A. Telescopic suction member for feeding sheet material. 3,957,263, Cl. 271-102.000.

Chronic, Bill M. Gimball nozzle-trim. 3,957,207, Cl. 239-265.350.

Chrysler Corporation: *See—*
Hurst, John W., 3,957,011.
Leising, Maurice Bernard; Benford, Howard Lee; and Bradley, Robert Leslie, 3,956,947.
Whitfield, James Harold, 3,957,106.

Chu, David Chau-Kwong: *See—*
Fienup, James R.; and Chu, David Chau-Kwong, 3,957,353.

Chun, Sun W.; Cronauer, Donald C.; and Leslie, Thomas W., to Gulf Research & Development Company. Process for the conversion of carbonaceous materials. 3,957,619, Cl. 208-10.000.

Chylewski, Christoph: *See—*
Schellenberg, Matthias; Chylewski, Christoph; and Meier, Max, 3,957,516.

Cianci, Arthur, to Polaroid Corporation. Reflex member hold-down mechanism. 3,957,136, Cl. 185-39.000.

Ciba-Geigy AG: *See—*
Lenoir, John, 3,957,860.
Schellenberg, Matthias; Chylewski, Christoph; and Meier, Max, 3,957,516.
Stauner, Thomas; Kitzing, Rainer; Hagen, Remon; and Boragine, Carlo, 3,958,050.

Ciba-Geigy Corporation: *See—*
Bollinger, Jack; Pigot, Jean-Pierre; and Vial, Jean, 3,957,481.
Dellian, Kurt A.; and Isharani, Jayanti V., 3,957,434.
Drabek, Jozef; Beriger, Ernst; and Bohner, Beat, 3,957,801.
Drabek, Jozef; Beriger, Ernst; and Bohner, Beat, 3,957,802.
Gordon, David A.; and Seltzer, Raymond, 3,957,726.
Hewitt, Brian; Hobday, Cyril; Jack, James; and Keenan, John Francis Edmund, 3,957,430.
Karrer, Friedrich; and Farooq, Saleem, 3,957,885.
Kleiner, Eduard Karl; and Dexter, Martin, 3,957,920.
Leone, Luigi; and Casagrande, Fulvio, 3,958,026.
Leutenegger, Willi; Buhler, Jakob; Markert, Jurgen; and Zurbuchen, Jacques, 3,957,429.
Meyer, Willy; Bohner, Beat; and Dawes, Dag, 3,957,924.
Singer, Heinrich; and Csajagi, Sandor, 3,958,061.
Zondler, Helmut, 3,957,820.

Ciechowski, Franciszek, to Imperial Chemical Industries Limited. Synthesis plant. 3,957,449, Cl. 23-289.000.

Cina, Baruch; Meron, Michael; Myron, Stuart Maurice; and Dror, Gidon, to Israel Aircraft Industries, Ltd. Heat treatment method for extending the secondary creep life of alloys. 3,957,542, Cl. 148-12.300.

Cincera, David L., to Monsanto Company. Method for preparation of ABS type resins. 3,957,912, Cl. 260-880.00R.

Cincinnati Mine Machinery Company, The: *See—*
Krekeler, Claude B., 3,957,153.

Cities Service Company: *See—*
Bouck, Larry S., 3,957,116.

Citizen Watch Co., Ltd.: *See—*
Nakajima, Fumio; Nikaido, Akira; Onda, Mitsuo; Machida, Takayasu; and Toida, Takashi, 3,958,167.

Cla-Val Co.: *See—*
Ensign, Harold W., 3,957,395.

Claes, Frans Henri: *See—*
Libeer, Marcel Jan; and Claes, Frans Henri, 3,957,490.

Claeys, Daniel Alois: *See—*
Lemahieu, Raymond Gerard; Janssens, Wilhelmus; and Claeys, Daniel Alois, 3,957,288.

Clark, Robert C., to General Electric Company. Method and apparatus for plug sensing. 3,958,163, Cl. 318-373.000.

Clark, Roger S., to Johns-Manville Corporation. Charcoal igniting device. 3,957,455, Cl. 44-35.000.

Clark, William H.; and Johnson, Robert D., to Dow Corning Corporation. Method for making paintable silicone surfaces and elastomer. 3,957,714, Cl. 260-33.6SB.

Clarke, Kelvin Arthur, to Commonwealth Steel Company Limited. Quantitative determination of elements in alloys. 3,957,373, Cl. 356-77.000.

Cleaveland, Charles M., to Westinghouse Electric Corporation. Metal-clad switchgear using vacuum interrupter elements with improved resilient supporting means. 3,958,093, Cl. 200-144.00B.

Clemens, Robert W., to Wesco Industries Corporation. Storage drum for intermediate yarn feeding device. 3,957,217, Cl. 242-47.010.

Clement, Donald R.; Helber, Carl A.; and Mason, Lawrence D., to Motorola, Inc. Automatic crystal diameter control for growth of semiconductor crystals. 3,958,129, Cl. 250-577.000.

Clerk, Robert Cecil. Axial piston pumps or motors. 3,956,972, Cl. 91-485.000.

Cloete, Francis Louis Dirk; and Haines, Alan Keith, to National Institute of Metallurgy. Contacting liquids and solids in countercurrent. 3,957,635, Cl. 210-24.000.

Close, Thomas E.: *See—*
Vogel, Walter H.; and Close, Thomas E., 3,956,976.

Closmann, Philip J., to Shell Oil Company. Explosive-aided oil shale cavity formation. 3,957,306, Cl. 299-4.000.

Clymer, Wilbur L.; and Klara, Charles J., to Binney & Smith Inc. Automated molding machine. 3,957,408, Cl. 425-144.000.

Coats, Robert Reid; and Greenway, John Michael, to Imperial Chemical Industries Limited. Self threadable grooved rollers. 3,957,218, Cl. 242-47.030.

Cochran, Michael J., to Texas Instruments Incorporated. Expandable data storage in a calculator system. 3,958,223, Cl. 340-172.500.

Cockerill-Ougree-Providence et Esperance-Longdoz, en Abrege "Cockerill": *See—*
Streel, Dominique, Thomas, Francois, Leon, 3,957,608.

Codrino, Giuseppe. Light diffusing device with light-guide cables and cable terminal. 3,958,114, Cl. 240-1.0LP.

Colasanti, Arduino; Kiehart, Lawrence Robert; and Levasseur, Dornis L., to Allied Chemical Corporation. Limiter for vehicle safety belt tension-relieving apparatus. 3,957,223, Cl. 242-107.600.

Coleman, Charles M. Method of making an automatic volume control pipet. 3,958,045, Cl. 427-230.000.

Colgate-Palmolive Company: *See—*
Cordon, Martin, 3,957,968.
Grimm, John Edward, III, 3,957,964.
Verite, Claude, 3,957,661.

Coltrinari, Enzo L.: *See—*
Johnson, Robert K.; and Coltrinari, Enzo L., 3,957,602.

Comben, Richard H.; and Doty, Richard L., to Medtronic, Inc. Power-source canister. 3,957,056, Cl. 128-419.00R.

Combustion Engineering, Inc.: *See—*
Horlitz, Carl Frederick, Jr., 3,956,898.
Round, Byron Joseph, 3,957,001.
Ward, Charles Theodore, 3,958,120.

Commercial Solvents Corporation: *See—*
Gallagher, John S., 3,957,864.
Urry, Wilbert Herbert; and Mullenbach, Guy Towns, 3,957,825.

Commissariat a l'Energie Atomique: *See—*
Boyer, Pierre; Pellissier, Henri; and Wacongne, Michel, 3,957,576.

Commonwealth Scientific and Industrial Research Organization: *See—*
Hodgkin, Jonathan Howard; Hawthorne, David Geoffrey; Swift, Jean Drummond; and Solomon, David Henry, 3,957,526.

Commonwealth Steel Company Limited: *See—*
Clarke, Kelvin Arthur, 3,957,373.

Compagnie Francaise de Raffinage: *See—*
Weisang, Joseph Edouard; Szabo, Georges; and Maurin, Jean, 3,957,900.

Compagnie General d'Electro Ceramique — Ceraver: *See—*
Le Bon, Georges, 3,957,560.

Component Manufacturing Service, Inc.: *See—*
Tantillo, James M.; and Ramsay, Donald C., 3,957,331.

Comtelco (U.K.) Limited: *See—*
Hill, John; Turczanski, Henryk; and Wallis, Frederick Henry, 3,958,154.

Conco Inc.: *See—*
Burt, Harold S., 3,958,102.

Confalone, Pasquale Nicholas: *See—*
Baggiolini, Enrico; Confalone, Pasquale Nicholas; Pizzolato, Giacomo; and Uskokovic, Milan Radoje, 3,957,794.

Conn, Gilbert E.: *See—*
Charsky, Ronald S.; Conn, Gilbert E.; Flamholz, Alexander L.; and Young, Harold J., 3,957,376.

Consolidation Coal Company: *See—*
Jamison, Will B.; and Petry, Eston F., 3,957,076.

Constantinescu, Petre: *See—*
Ceausescu, Ion; Constantinescu, Petre; Oachis, Emil; and Cristea, Nicolae, 3,956,852.

Continental Can Company, Inc.: *See—*
Gor, Vishnu P. J., 3,957,708.
Hasegawa, Gary K., 3,957,172.

Continental Oil Company: *See—*
Chapman, William L., 3,958,216.

Conwed Corporation: *See—*
Sundin, George Holger, 3,957,554.

Cook, Milton L., to Quaker Oats Company, The. Coating fruit pieces with liquid shortening to stabilize against degradation and discoloration. 3,958,021, Cl. 426-268.000.

Cook, William H.: *See—*
Hostettler, Fritz; Cook, William H.; and Lombardi, Frank G., 3,957,753.

Cooley, Carl R.; and Lerch, Ronald E., to United States of America, Energy Research and Development Administration. Chemical digestion of low level nuclear solid waste material. 3,957,676, Cl. 252-301.10W.

Coombes, Daniel J.; and Messina, Benedicto U., to International Business Machines Corporation. Fault tolerant least recently used algorithm logic. 3,958,228, Cl. 340-172.500.

Cooper, John Edwin, to Sperry Rand Limited. Pressure control in hydraulic systems. 3,957,396, Cl. 417-218.000.

Copal Company Limited: *See—*
Okabe, Katsuhiko, 3,958,254.

Copolymer Rubber & Chemical Corporation: *See—*
Von Bodungen, George A.; and Meredith, Curtis L., 3,957,919.

Coppola, John J. Gas washing device. 3,957,466, Cl. 55-256.000.

Corboud, Gerard, to Josef Voss KG., Firma. Lock for runners, particularly runners of sliding glass doors, on display-window cases. 3,956,911, Cl. 70-100.000.

Corby, William Joseph; Figuli, Edward Stephen; and Winters, Earl Dallas, to Western Electric Company, Inc.; and Bell Telephone Laboratories, Incorporated. Apparatus for treating portions of articles. 3,957,614, Cl. 204-224.00R.

Cordon, Martin, to Colgate-Palmolive Company. Dentifrices containing flat flakes of alpha-alumina. 3,957,968, Cl. 424-57.000.

Corneal Sciences, Inc.: *See—*
Mancini, William L.; Korb, Donald R.; and Refojo, Miguel F., 3,957,362.

Cornell Research Foundation, Inc.: *See—*
Nath, Kaser Rajinder; and Newbold, Mark William, 3,958,034.

Corning Glass Works: *See—*
DeMunn, Clark V.; Kerko, David J.; and Westwig, Ralph A., 3,957,499.
Elmer, Thomas H., 3,958,058.
Galusha, Richard E.; Kane, William T.; Megles, John E., Jr.; and Williams, Joseph M., 3,958,052.
Reade, Richard F., 3,957,498.
Weetall, Howard H., 3,957,748.

Coroneos, James H. Multi-element vertical rotisserie. 3,956,979, Cl. 99-421.00V.

Corrado, Anthony P., to United States of America, Army. Fluid explosive initiator. 3,956,993, Cl. 102-81.000.

Corse, Louis. Device for longitudinally severing webs. 3,956,957, Cl. 83-482.000.

Cory, Robert P.: *See—*
Armbruster, Frederick C.; Heady, Robert E.; and Cory, Robert P., 3,957,587.

Cosden Technology, Inc.: *See—*
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Costa, Bruno: *See—*
Carlomagno, Giovanni Maria; Cecere, Antonio; Costa, Bruno; Muni, Nicola; and Napolitano, Luigi, 3,957,258.

Costa, Robert B. Sprinkler. 3,957,205, Cl. 239-230.000.

Costin, Robert W.; and Murphy, Randal T., to Lear Siegler, Inc. Latch mechanism for horizontally oscillating seat. 3,957,243, Cl. 248-370.000.

Coulter, Edward Howard: *See—*
Fekete, Simon Otto; MacKenzie, Colin Bruce; Thornhill, Philip George; Coulter, Edward Howard; and Agnew, Kenneth Leslie, 3,957,484.

Coulter Information Systems, Inc.: *See—*
Kuehnle, Manfred R., 3,958,162.

County Commercial Cars Limited: *See—*
Eggleton, Geoffrey Donald; and Harrison, Richard, 3,956,945.

Coursaut, Henri, to Le Bouchage Mecanique. Bottle cap. 3,957,169, Cl. 215-253.000.

Courtaulds Limited: *See—*
Betts, Max William; and Robinson, Frank, 3,956,908.

Cousse, Henri: *See—*
Stenger, Antoine; Cousse, Henri; and Mouzin, Gilbert, 3,958,002.

Cox, Lyndon S., to United States of America, Army. Control system for pre-inflation of pilot's G-suit. 3,956,772, Cl. 2-2.10A.

Cox, William F. Quick detachable escape fastener. 3,957,068, Cl. 135-15.0CF.

CPC International Inc.: *See—*
Armbruster, Frederick C.; Heady, Robert E.; and Cory, Robert P., 3,957,587.
Fleck, Charles Jacques; De Pizzol, Jurg Max; and Tolar, Peter, 3,958,031.
Molotsky, Hyman Max; and Gramera, Robert Eugene, 3,957,702.

Crabb, Albert B., Jr.: *See—*
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Crabtree, Eleanor V.; and Poziomek, Edward J., to United States of America, Army. Method for detection of glycolates. 3,957,437, Cl. 23-230.00B.

Craft, James A.: *See—*
Bach, Paul S.; Craft, James A.; Lammers, Gerald B.; and Rogers, James C., 3,957,264.

Cragoe, Edward J., Jr.; and Fanelli, George M., Jr., to Merck & Co., Inc. Phenoxyacetic acid derivatives as uricosuric agents. 3,958,004, Cl. 424-275.000.

Crasnianski France S.A.: *See—*
Crasnianski, Serge Paul, 3,956,968.

Crasnianski, Serge Paul, to Crasnianski France S.A. Machine for automatically duplicating flat keys. 3,956,968, Cl. 90-13.050.

Crawford, Duncan J.: *See—*
Egleston, Harry B.; Lisiecki, Robert E.; Crawford, Duncan J.; Braun, Eric A.; and Walke, Earl W., Jr., 3,956,975.

Crawley, Lantz Stephen: *See—*
Fanshawe, William Joseph; Wiegand, Gretchen Ellen; Crawley, Lantz Stephen; and Safir, Sidney Robert, 3,957,805.

Cristea, Nicolae: *See—*
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Croft, George Thomas, to Addressograph Multigraph Corporation. Duplicating apparatus utilizing ion modulating means as the image generating source and method of duplicating therewith. 3,957,365, Cl. 355-3.00R.

Crompton & Knowles Corporation: *See—*
Vogel, Walter H.; and Close, Thomas E., 3,956,976.

Cronauer, Donald C.: *See—*
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Crone, John M., Jr.: *See—*
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Cross, Barrington; and Walworth, Bryant Leonidas, to American Cyanamid Company. 4-Alkyl-1,2-dimethyl-3,5-diphenylpyrazolium salts and derivatives thereof as fungicidal agents. 3,958,001, Cl. 424-273.000.

Cross, Peter Edward; and Gadsby, Brian, to Pfizer Inc. 2 And 3-substituted-4-(heterocyclic-amino-sulfonyl)benzene sulfonamides. 3,957,796, Cl. 260-293.660.

Cross, Thomas A.: *See—*
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Jowett, Terence W.; Knights, Anthony D. M.; and Cross, Thomas A., 3,958,122.

Crowley, Daniel Joseph: *See—*
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Crown City Plating Company: *See—*
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Crucible Inc.: *See—*
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Crumpacker, William H. Thread reconditioning tool. 3,956,787, Cl. 10-1.00B.

Csajagi, Sandor: *See—*
Singer, Heinrich; and Csajagi, Sandor, 3,958,061.

CSELT - Centro Studi e Laboratori Telecommunicazioni SpA: *See—*
Calcagno, Piero; and Garetti, Enzo, 3,958,086.

Cull, Geoffrey Maurice; and Fisher, Phillip Andrew, to Magnesium Elektron Limited. Addition of magnesium to molten metal. 3,957,502, Cl. 75-58.000.

Culmann, Gunter: *See—*
Klinkner, Hans-Guido; and Culmann, Gunter, 3,956,900.

Cummins, Curtis Farris; and Kelly, Kenneth Wayne, to Caterpillar Tractor Co. Brake control system with proportional loading of the brakes during retarding. 3,957,315, Cl. 303-6.00C.

Cuniberti, Mario, to Owens-Illinois, Inc. Cooling pressed glass articles. 3,957,478, Cl. 65-181.000.

Curt G. Joa, Inc.: *See—*
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Curtiss-Wright Corporation: *See—*
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Cutler, Nigel A.; and Bradley, Michael L., to British Industrial Plastics Limited. Aminoplast moulding materials with cured aminoplast filler. 3,957,701, Cl. 260-2.50F.

Cyclamatic, Inc.: *See—*
Lovell, Paul W., 3,957,937.

Cyprus Metallurgical Processes Corporation: *See—*
Johnson, Robert K.; and Coltrinari, Enzo L., 3,957,602.

Daggett, Myron L., Jr.; and Douglas, Leon L., to Boeing Company, The. Helicopter yaw and propulsion mechanism. 3,957,226, Cl. 244-17.190.

Daghe, Joseph L., to Mueller Co. Gate valve structure. 3,957,245, Cl. 251-214.000.

Dahm, Klaus-Peter. Cosmetic stick. 3,957,066, Cl. 132-88.700.

Daikyo Oil Company Ltd.: *See—*
Fukui, Yukimasa; Hosoi, Teikichi; Makita, Hisashi; Mukaida, Heihachiro; and Takahashi, Toshiro, 3,957,620.

Dainichi-Nippon Cables, Ltd.: *See—*
Miyamoto, Haruo; Igami, Ikuo; Uehara, Masaru; Fujita, Hideo; Itoh, Hirotaka; and Kan, Zyozi, 3,957,573.

Dainippon Pharmaceutical Co., Ltd.: *See—*
Nishimura, Haruki; Uno, Hitoshi; Natsuka, Kagayaki; Shimokawa, Noriaki; Shimizu, Masanao; and Nakamura, Hideo, 3,957,763.

Dale, Clarence R. Method and apparatus for bottom hole testing in wells. 3,957,117, Cl. 166-264.000.

Damiano, Ralph R., to Litton Systems, Inc. Miniature electrical connector having contact centering means. 3,957,337, Cl. 339-217.00S.

Dana Corporation: *See—*
Belter, Jerome G.; and Battistoni, Dan C., 3,957,275.
Belter, Jerome G., 3,957,279.
Kaminski, David C., 3,957,333.

Danesh, Andre. Process for treating seafood. 3,958,022, Cl. 426-271.000.

Daniel, Donald D. Acoustic refractors. 3,957,134, Cl. 181-176.000.

Darda, Helmut. Apparatus for mechanically breaking up rock. 3,957,309, Cl. 299-22.000.

Dart Industries Inc.: *See—*
Perron, Peter James; and Schafer, Joseph Leopold, 3,957,909.
Swett, James B., 3,957,097.

Dart, Larry K., to International Telephone and Telegraph Corporation. Head. 3,958,158, Cl. 317-141.00S.

Davidson, Jackson B.: *See—*
Case, Arthur L.; and Davidson, Jackson B., 3,958,079.

Davidson, Sidney Hayes, to Du Pont de Nemours, E. I., and Company. 2-Cyano-2-hydroxyiminoacetamides as plant disease control agents. 3,957,847, Cl. 260-465.400.

Davidts, Jan: *See—*
Buyssens, Noel; Davidts, Jan; and Nottebaere, Arseen, 3,957,091.

Davies, Charles Bloor; Davies, James Francis; and Neillie, William Fredrick Soutar, to Lever Brothers Company. Detergent compositions containing calcium carbonate. 3,957,695, Cl. 252-532.000.

Davies, James Francis: *See—*
Davies, Charles Bloor; Davies, James Francis; and Neillie, William Fredrick Soutar, 3,957,695.

Davies, Terrence Ardern; and Swallow, Peter John, to Square D Company. Electrical contact materials. 3,957,508, Cl. 75-206.000.

Davis, Billy K., to United States of America, National Aeronautics and Space Administration. Solar energy power system. 3,957,030, Cl. 126-270.000.

Davis, Dicky D., to United States of America, Commerce. Color subcarrier frequency comparator. 3,958,269, Cl. 358-10.000.

Davis, Harry C. Convertible auxiliary turbine for aircraft. 3,957,229, Cl. 244-53.00R.

Davis, Kenneth E., to BASF Wyandotte Corporation. Solid propellant binder and propellant. 3,956,890, Cl. 60-219.000.

Davis, Walter S.; and Pugmire, T. Kent, to Avco Corporation. Electrothermal reactor. 3,956,885, Cl. 60-39.46M.

Dawes, Dag: *See—*
Meyer, Willy; Bohner, Beat; and Dawes, Dag, 3,957,924.

Dawes, Ernest Fredrick. Molecule separators. 3,957,470, Cl. 55-342.000.

Dawson, Chester H.: *See—*
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de Beaulieu, Henri Philippe: *See—*
Kalopissis, Gregoire; Abegg, Jean-Louis; Ghilardi, Guiliana; and de Beaulieu, Henri Philippe, 3,957,774.

Decker, Peter: *See—*
Wirz, Burkhardt; and Decker, Peter, 3,956,986.

DeGrazia, Victor S., to Ford Motor Company. Clutch actuating mechanism. 3,957,380, Cl. 403-14.000.

Delfino, Michelangelo, to North American Philips Corporation. Method and apparatus for isothermal crystal growth. 3,957,604, Cl. 204-130.000.

Delin, Heinz: *See—*
Bonk, Willi; and Delin, Heinz, 3,956,939.

Della Torre, Giancarlo, to Singer Company, The. Bed cover for a sewing machine. 3,957,002, Cl. 112-258.000.

Dellian, Kurt A.; and Isharani, Jayanti V., to Ciba-Geigy Corporation. Coloring synthetic fibers with diphenylcarbinol dyeing assistants. 3,957,434, Cl. 8-173.000.

Delmar Chemicals Limited: *See—*
Kubela, Rudolf; and Hughes, Lise A., 3,957,795.
Podesva, Ctirad; and Hughes, Lise A., 3,957,776.

Delta Precision Casting Co. Ltd.: *See—*
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DeMaine, Frank J.; Pelkie, Robert E.; Smith, Normand C.; and Tomek, Reinhold E., to International Business Machines Corporation. Ink jet drop generator. 3,958,249, Cl. 346-1.000.

De Marinis, Robert M., to SmithKline Corporation. Substituted acetamidocephalosporins. 3,957,770, Cl. 260-243.00C.

DeMarinis, Robert M., to SmithKline Corporation. Substituted mercaptoacetamidocephalosporins. 3,957,984, Cl. 424-246.000.

Demole, Edouard P., to Firmenich S.A. Aromatic compositions. 3,957,061, Cl. 131-17.00R.

Demoute, Jean-Pierre: *See—*
Hainaut, Daniel; Demoute, Jean-Pierre; and Girault, Pierre, 3,958,005.

DeMunn, Clark V.; Kerko, David J.; and Westwig, Ralph A., to Corning Glass Works. Fast-fading index-corrected photochromic glass compositions. 3,957,499, Cl. 106-54.000.

Denaro, Salvatore. Expandible plugs for securing a tent. 3,957,069, Cl. 135-15.0PE.

Dengel, Ferdinand: *See—*
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de Niet, Edmond; and van den Enden, Adrianus Wilhelmus Maria, to U.S. Philips Corporation. Current pulse generator. 3,958,160, Cl. 317-148.50R.

De Pizzol, Jurg Max: *See—*
Fleck, Charles Jacques; De Pizzol, Jurg Max; and Tolar, Peter, 3,958,031.

Desai, Arvind: *See—*
Nitschke, Eberhard; Desai, Arvind; and Ilgner, Hartmut, 3,957,961.

Desourdy, Bernard. Tunnel-drilling truck. 3,957,124, Cl. 173-28.000.

Deuschel, Walter; Gulbins, Erich; Hauss, Alfred; Lausberg, Dietrich; and Sigmund, Wilhelm, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Polymerization of vinyl chloride in aqueous suspension. 3,957,744, Cl. 526-73.000.

Deutsch, Ralph, to Nippon Gakki Seizo Kabushiki Kaisha. Formant filtering in a computor organ. 3,956,960, Cl. 84-1.190.

Deutsche Automobilgesellschaft mbH, Firma: *See—*
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Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Pochert, Johannes; Wolff, Siegfried; and Thurn, Friedrich, 3,957,718.

Devolle, Guy Eugene Gaston, to S. A. Chadefaud. Electrically insulated power line for supplying electrical energy to mobile devices. 3,957,142, Cl. 191-23.00A.

deVries, Egbert, to Quad Corporation. Bactericidal wash for meat. 3,958,020, Cl. 426-265.000.

DeWavrin, Daniel; Nitecki, Janusz; and Bourbotte, Lionel, to Etablissements P. Piel Societe Anonyme. Modifier. 3,957,081, Cl. 137-625.400.

Dexter, Martin: *See—*
Kleiner, Eduard Karl; and Dexter, Martin, 3,957,920.

Diamond Shamrock Corporation: *See—*
Beckers, Norman L.; and Rowe, Edward A., 3,957,893.

Diaz, Stephen H.: *See—*
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DiBiasio, Vincent I.; Simons, Charles W.; and O'Neill, Gerald J., to W. R. Grace & Co. Halogenated cyclobutyl ether anesthetics. 3,958,013, Cl. 424-339.000.

Dickie, Ray A.; and Cassatta, Joseph C., to Ford Motor Company. Radiation polymerizable coating composition containing an unsaturated phosphoric ester. 3,957,918, Cl. 260-885.000.

Dieckelmann, Gerhard; Hartmann, Helmut; and Plapper, Jurgen, to Henkel & Cie G.m.b.H. Fatty acid ester mixtures liquid at low temperatures and process. 3,957,426, Cl. 8-94.230.

Diefenbacher, Walter; Schlosser, Peter; and Schwind, Eduard, to Gesellschaft fur Kernforschung m.b.H. Apparatus for conducting electrolytic reactions. 3,957,615, Cl. 204-260.000.

Diehl, Francis L., to Procter & Gamble Company, The. Fabric treatment composition. 3,958,059, Cl. 428-260.000.

Diery, Helmut; Schrinner, Elmar; Gunther, Kurd; and Schneider, Gerhart, to Hoechst Aktiengesellschaft. Anti-microbially active surface-active agents. 3,957,863, Cl. 260-534.00R.

Diggs, Richard E. Quick-connect fittings for a trickle type irrigation system. 3,957,292, Cl. 285-150.000.

Dikhoff, Johannes Aloysius Maria; and Smith, Gijsbertus Marinus, to U.S. Philips Corporation. Method of manufacturing a luminescent sulfide. 3,957,678, Cl. 252-301.60S.

Dilling, Peter: *See—*
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Di Maio, Louis R.: *See—*
Chiesa, Peter J., Jr.; and Di Maio, Louis R., 3,957,658.

Di Perna, James. Ship ballast, oil and water separation system. 3,957,009, Cl. 114-74.00R.

Display Originals, Inc.: *See—*
Palamara, Joseph P., 3,957,174.

Dittrich, Werner; and Rauch, Werner, to Siemens Aktiengesellschaft. Imprinting arrangement for the marking of cylindrical sample receptacles for specimen identification. 3,956,983, Cl. 101-6.000.

Diversified Products Corporation: *See—*
Silberman, Ira J., 3,957,268.

Dixon, Norman E., to Battelle Development Corporation. Method of controlling the polarization condition of transducers. 3,958,161, Cl. 317-262.00F.

Dockner, Toni; and Krug, Herbert, to BASF Aktiengesellschaft. Continuous production of N-alkylarylamines. 3,957,874, Cl. 260-577.000.

Doherty, Donald W.; and Wells, Elbert J., Jr., to United States of America, Navy. Universal modularized digital controller. 3,958,109, Cl. 235-151.000.

Doi, Kazuo; Murakami, Takeru; and Nakano, Yoshinobu, to Matsushita Electric Works, Ltd. Novel solid thermosetting resins and processes for preparing same. 3,957,903, Cl. 260-836.000.

Domes, Norbert. Briefcase. 3,957,141, Cl. 190-42.000.

Donaldson Company, Inc.: *See—*
Schoen, Donald W.; and Silvernail, James M., 3,957,639.
Swanson, Ian N., 3,957,132.

Donnelly, William R., to Readi Temp Inc. Chemical heat transfer unit. 3,957,472, Cl. 62-4.000.

Donovan, Lawrence P.; Maguire, Eileen; and Kadison, Leon A., to Crown City Plating Company. Aqueous suspensions for surface activation of nonconductors for electroless plating. 3,958,048, Cl. 427-304.000.

Dorawala, Tansukhlal G.; Estes, John H.; and Kerr, Edwin R., to Texaco Inc. Preparation of methane, hydrogen and carbon monoxide containing gases. 3,957,682, Cl. 252-373.000.

Dorlars, Alfons; and Neuner, Otto, to Bayer Aktiengesellschaft. 3-Aryl-7-pyrazolyl-coumarins. 3,957,817, Cl. 260-310.00R.

Doty, Richard L.: *See—*
Comben, Richard H.; and Doty, Richard L., 3,957,056.

Doughty, Joseph B.; and Dilling, Peter, to Westvaco Corporation. Cationic bituminous emulsions. 3,957,524, Cl. 106-277.000.

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Douta, Kikuo: *See—*
Sasano, Akira; Douta, Kikuo; and Ashikawa, Mikio, 3,957,609.

Doversberger, Richard A., to Westinghouse Air Brake Company. Pressure intensifier unit for vehicle braking system. 3,957,313, Cl. 303-2.000.

Dow Chemical Company, The: *See—*
Alexander, George B.; and Carpenter, Norman F., 3,957,529.
Bressler, Wilbur L.; and Taylor, Clyde G., 3,957,832.
Filter, Harold E.; and Stevens, Don L., 3,957,551.
Grandjean, George Victor, 3,957,077.
Hatch, Melvin J., 3,957,698.
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Dow Corning Corporation: *See—*
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Drabek, Jozef; Beriger, Ernst; and Bohner, Beat, to Ciba-Geigy Corporation. O,S-Dialkyl esters of pyridylthio- and pyridyldithiophosphoric acid. 3,957,801, Cl. 260-294.80K.

Drabek, Jozef; Beriger, Ernst; and Bohner, Beat, to Ciba-Geigy Corporation. O,S-Dialkyl esters of pyridylthio- and pyridyldithiophosphoric acid. 3,957,802, Cl. 260-294.80K.

Dragerwerk Aktiengesellschaft: *See—*
Freytag, Klaus; and Warnow, Detlef, 3,957,047.

Draiswerke GmbH: *See—*
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Drake, Crandell & Batchelder: *See—*
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Drake, Harry E., to Browning Mfg. Company. Take-down and folding bow. 3,957,027, Cl. 124-23.00R.

Draney, Charles T.: *See—*
Lambly, Charles A. R.; and Draney, Charles T., 3,957,308.

Drehman, Lewis E.: *See—*
Farha, Floyd, Jr.; and Drehman, Lewis E., 3,957,688.

Drevet, Georges. Simplified control mechanisms for sewing machines. 3,957,003, Cl. 112-158.00R.

Dreyer, William J.: *See—*
Rembaum, Alan; Yen, Shiao-Ping Siao; and Dreyer, William J., 3,957,741.

Dreyfuss, Robert M., to United States of America, Energy Research and Development Administration. Closed cycle ion exchange method for regenerating acids, bases and salts. 3,957,956, Cl. 423-394.000.

Drinkard, William F., Jr.; and Brown, Henry S., to Mineral Research & Development Corporation. Electrochemical mining. 3,957,601, Cl. 204-105.00R.

Drissel, Gerald M.; and Sircar, Shivaji, to Air Products and Chemicals, Inc. Oxygen enrichment process. 3,957,463, Cl. 55-25.000.

Dror, Gidon: *See—*
Cina, Baruch; Meron, Michael; Myron, Stuart Maurice; and Dror, Gidon, 3,957,542.

DuBrow, Paul; and Zakaria, Moneeb, to Nalco Chemical Company. Zinc electroplating. 3,957,595, Cl. 204-55.00R.

Duff-Norton Company, Inc.: *See—*
Opyrchal, Martin A., 3,957,144.

Duffy, Francis A. Light emitting diode display apparatus and system. 3,958,235, Cl. 340-336.000.

Duguay, Michel Albert, to Bell Telephone Laboratories, Incorporated. Optical memory systems utilizing organ arrays of optical fibers. 3,958,229, Cl. 340-173.0LM.

Duhaut, Pierre; Martino, Germain; and Miquel, Jean, to Societe Francaise des produits pour Catalyse. Catalyst for hydrocarbon conversion. 3,957,686, Cl. 252-441.000.

Duncan, Farris N.: *See—*
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Dunkley, James L.: *See—*
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Wheatley, Roger Warren; Treadway, Duane Eugene; and Toennies, Ralf Gerrit, 3,957,959.
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Durham, R. Richard. Adapter apparatus for container transporting vehicles. 3,957,166, Cl. 214-505.000.

Durr, Herbert, to Draiswerke GmbH. Stirring mill. 3,957,210, Cl. 241-46.020.

Dyar, Ralph E.: *See—*
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Dynatron/Bondo Corporation: *See—*
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Dyott, Richard Burnaby; and Stevenson, John Leslie, to Post Office, The. Optical communications systems. 3,957,343, Cl. 350-96.0WG.

E. R. Squibb & Sons, Inc.: *See—*
Aszalos, Adorjan; and Vandeputte, John, 3,957,754.

Bodanszky, Miklos, 3,957,760.
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Yale, Harry Louis; and Petigara, Ramesh B., 3,957,799.
Yale, Harry Louis; and Petigara, Ramesh B., 3,957,806.

Eagan, Robert J., to United States of America, Energy Research and Development Administration. Molybdenum sealing glass-ceramic composition. 3,957,496, Cl. 106-39.800.

Eastham, John Frederick; Laithwaite, Eric Roberts; Fellows, Thomas George; and Bromilow, David John English, to Tracked Hovercraft Limited. Linear induction motors. 3,958,138, Cl. 310-13.000.

Eastman Kodak Company: *See—*
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Beach, David Easton, 3,958,258.
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Ebihara, Tomoo; and Serizawa, Motonobu, to Sanyo Silicon Electronics Co., Ltd. Electronic percussion instrument. 3,956,959, Cl. 84-1.150.

Eckelt, Michael: *See—*
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Heyden, Rudi; Eckelt, Michael; Mahall, Karl; and Kuper, Wilfried, 3,957,712.

Edelson, Andrew C.; and Levine, Soulie. Fuel management computer. 3,958,107, Cl. 235-150.210.

Edgar, John Peter: *See—*
Bailey, Arthur Raymond; and Edgar, John Peter, 3,958,166.

Edling, Porter R.; Jefferies, Robert K.; and Shelton, Joseph T., to Offshore Company, The. Ball joint assembly with internal passages. 3,957,291, Cl. 285-136.000.

Edmonson, Lawrence Aldean, to Edmonson, Lawrence Aldean. In-line filtering device. 3,957,644, Cl. 210-169.000.

Edwards, Bryant, to Illinois Tool Works Inc. Method and apparatus for converting nestable plastic containers into non-nestable containers products. 3,957,415, Cl. 425-387.00B.

Edwards, Laroy H., to Chevron Research Company. Fungicidal 2-arylthio-, 2-alkylthio- and 2-haloalkylthio-1,2,4-oxadiazolidine-3,5-diones. 3,958,000, Cl. 424-272.000.

Edwards, Thomas C., to Rovac Corporation, The. Compressor-expander for refrigeration having dual rotor assembly. 3,956,904, Cl. 62-402.000.

Edwards, William J., to Honeywell Information Systems, Inc. Rotary paper cutting device. 3,956,954, Cl. 83-285.000.

Egasira, Hirosi: *See—*
Oka, Akira; Minami, Noriaki; Kondou, Sigehiro; Nakatsuka, Hirosi; Egasira, Hirosi; Hirayama, Mamoru; Hayasi, Yasunori; and Otsukawa, Kazunobu, 3,958,103.

Egbers, Gerhard: *See—*
Artzt, Peter; Bausch, Albert; and Egbers, Gerhard, 3,956,876.

Eggleton, Geoffrey Donald; and Harrison, Richard, to County Commercial Cars Limited. Driving transmissions for motor vehicles. 3,956,945, Cl. 74-710.500.

Egleston, Harry B.; Lisiecki, Robert E.; Crawford, Duncan J.; Braun, Eric A.; and Walke, Earl W., Jr., to Ex-Cell-O Corporation. Packaging method and apparatus. 3,956,975, Cl. 93-49.00M.

Egli, Walter; Bailey, William H., Jr; Leary, David F.,; and Lansley, Richard J., to General Atomic Company. Apparatus for producing microspherical particles and method for operating such apparatus. 3,957,933, Cl. 264-14.000.

Egon Evertz: *See—*
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Ehren, Fritz H. Roller massager. 3,957,039, Cl. 128-58.000.

Ehrsam, William Friedrich; Meyer, Carl H. W.; Powers, Robert Lowell; Prentice, Paul Norman; Smith, John Lynn; and Tuchman, Walter Leonard, to International Business Machines Corporation. Block cipher system for data security. 3,958,081, Cl. 178-22.000.

Elachi, Charles: *See—*
United States of America, National Aeronautics and Space Administration; Elachi, Charles; Evans, Gary A.; and Yeh, Cavour, 3,958,188.

Elco Corporation: *See—*
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Electromet, Inc.: *See—*
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Elin-Union Aktiengesellschaft fur Elektrische Industrie: *See—*
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Elliott, Curtis Homer, Jr.: *See—*
Ostermaier, John Joseph; and Elliott, Curtis Homer, Jr., 3,957,689.

Ellis, Stephen Robert Mercer; Priestley, Ronald; and McKeown, Kevin Joseph, to Mass Transfer Limited. Fluid-fluid contact method and apparatus. 3,957,931, Cl. 261-98.000.

Ellsworth, Eric D., to Ford Motor Company. Fluid flow control valve. 3,957,072, Cl. 137-38.000.

Elmer, Thomas H., to Corning Glass Works. Ultra-low expansion ceramic articles. 3,958,058, Cl. 428-220.000.

Emanuel, Nikolai Markovich: *See—*
Bobolev, Alexandr Vasilievich; Tatikolov, Alexandr Sergeevich; Lukashina, Natalya Nikolaevna; Krainov, Ivan Stepanovich; and Emanuel, Nikolai Markovich, 3,957,690.

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Emigh, Stuart G.: *See—*
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Enchelmaier, Harvard W. K. Conveyor cleaning device. 3,957,155, Cl. 198-230.000.

Enders, Dieter: *See—*
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Engel, Simon L., to Caterpillar Tractor Co. Laser beam shaping arrangement. 3,957,339, Cl. 350-6.000.

English, J. L., to Chem-Farm, Inc. Earthworking implement with automatic fluid flow shut-off manifold. 3,956,999, Cl. 111-7.000.

Ensign, Harold W., to Cla-Val Co. Method and apparatus for controlling a pump. 3,957,395, Cl. 417-12.000.

Erbes, John G.: *See—*
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Eriksson, Erik Folke, to Mo ochs Domsjo AB. Process for the manufacture of paper pulp from waste paper. 3,957,572, Cl. 162-4.000.

Esseluhn, Werner F.: *See—*
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Esser, Leonhard, to U.S. Philips Corporation. Method of manufacturing a tube assembly for electric lamps. 3,956,808, Cl. 29-25.130.

Essig, Erich: *See—*
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Esterhammer, Josef Hartmut: *See—*
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Etablissement Thermocrete Baupatente Verwertungsgesellschaft: *See—*
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Eugene Doll & Novelty Co., Inc.: *See—*
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Evans, Charles W., to International Business Machines Corporation. Control store system with flexible control word selection. 3,958,227, Cl. 340-172.500.

Evans, Edgar L.: *See—*
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Evans, Gary A.: *See—*
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Evenson, Robert E., to Caterpillar Tractor Co. Log skidder with implement mounted cable guide means. 3,956,835, Cl. 37-117.500.

Evers, William J.; Heinsohn, Howard H., Jr.; Mayers, Bernard J.; and Karoll, Elizabeth A., to International Flavors & Fragrances Inc. Novel flavoring compositions and products comprising 2,5-dimethyl-3-thioisovaleryl furan. 3,958,029, Cl. 426-535.000.

Evertz, Egon; and Seybold, Rolf, to Egon Evertz. Holding device for manually portable drilling machines. 3,957,387, Cl. 408-78.000.

Eves, Richard John, to Lucas Industries Limited. Gas turbine engine fuel control systems. 3,956,884, Cl. 60-39.28R.

Ex-Cell-O Corporation: *See—*
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Fabel, Arthur J.; and Ingham, Herbert S., Jr., to Metco, Inc. Plasma flame-spraying process employing supersonic gaseous streams. 3,958,097, Cl. 219-76.000.

Fabian, Arthur C.; Genzer, Jerome D.; Kasulanis, Charles Francis; Shavel, John, Jr.; and Zinnes, Harold, to Warner-Lambert Company. Process for the preparation of 4-hydroxy-3-(5-methyl-3-isoxazolylcarbamoyl)-2-methyl-2H-1,2-benzothiazine 1,1-dioxide. 3,957,772, Cl. 260-243.00R.

Fadler, Norman L.: *See*—
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Fadler, Walter: *See*—
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Fairweather, Michael J.; and Topping, John A., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Alkaline battery seal. 3,957,538, Cl. 136-133.000.

Faivre, Christian, to Les Fabriques d'Assortments Reunies. Escapement-type drive mechanism for watches and the like. 3,956,941, Cl. 74-1.500.

Falke, Erich, to Knorr-Bremse GmbH. Device for monitoring the flow in the air line of an air brake system on a railway vehicle. 3,957,314, Cl. 303-3.000.

Falkenburg, Rudy Andre; van Kemenade, Antonius Wilhelmus Cornelis; and Lersmacher, Bernhard, to U.S. Philips Corporation. Cell for measuring the amount of CO in a gas. 3,957,610, Cl. 204-195.00R.

Fanelli, George M., Jr.: *See*—
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Fanshawe, William Joseph; Wiegand, Gretchen Ellen; Crawley, Lantz Stephen; and Safir, Sidney Robert, to American Cyanamid Company. Substituted pyridines and diazines and methods of preparing the same. 3,957,805, Cl. 260-296.00R.

Farha, Floyd, Jr.; and Drehman, Lewis E., to Phillips Petroleum Company. Catalytic dehydrogenation process. 3,957,688, Cl. 252-455.00R.

Farino, Frank G., to Leading Lady Foundations, Inc. Brassiere. 3,957,057, Cl. 128-478.000.

Farmery, David William: *See*—
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Faulhaber, Mark E.; and Smith, Edmund H., Jr., to Du Pont de Nemours, E. I., and Company. Optical-electrical web inspection system. 3,958,127, Cl. 250-563.000.

Fauth, William L., Jr.; Jones, Daniel S.; Kolsun, George J.; Erbes, John G.; Brennan, John J.; Weissburg, James A.; and Sharbaugh, John E., to United States of America, Energy Research and Development Administration. Mechanical design of a light water breeder reactor. 3,957,575, Cl. 176-18.000.

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Federal Paper Board Company, Inc.: *See*—
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Federspiel, Joseph A., to FMC Corporation. Tractor vehicle mounted lift assembly provided with latch means. 3,957,123, Cl. 172-481.000.

Fegley, Charles R.; and Esseluhn, Werner F. Anti-burglary sound emitting device. 3,957,012, Cl. 116-6.000.

Fehrs, Hellmuth, to Joh. Friedrich Behrens Metallwaren-Fabrik. Fastener-driving tool. 3,957,192, Cl. 227-123.000.

Fekete, Arisztid Z., to Raymond Lee Organization, Inc., The, a part interest. Game: whispering stick. 3,957,270, Cl. 273-95.00F.

Fekete, Simon Otto; MacKenzie, Colin Bruce; Thornhill, Philip George; Coulter, Edward Howard; and Agnew, Kenneth Leslie. Fluid bed roasting of metal sulphides at high temperatures. 3,957,484, Cl. 75-9.000.

Fellows, Harrison E. Mold making method and apparatus. 3,957,103, Cl. 164-16.000.

Fellows, Thomas George: *See*—
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Ferraro, Kenneth N.; and Ferraro, Betty Nell. Durable dental floss. 3,957,067, Cl. 132-89.000.

Ferrell, John Lee; and Poppelsdorf, Fedor, to Union Carbide Corporation. Synthesis of bis[2-(N,N-dimethylamino)ethyl] ether. 3,957,875, Cl. 260-585.00B.

Ferres, Harry; Kemmenoe, Adrian Victor; and Best, Desmond John, to Beecham Group Limited. Penicillins. 3,957,759, Cl. 260-239.100.

Ferriday, John E.; Kendall-Smith, Brian J.; and Bradley, Michael L., to British Industrial Plastics Limited. Filled aminoplast moulding materials. 3,957,700, Cl. 260-2.50F.

Fertig, Joseph: *See*—
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Fiber Industries, Inc.: *See*—
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Fiedler, Howard C., to General Electric Company. Method of producing oriented silicon-iron sheet material with boron and nitrogen additions. 3,957,546, Cl. 148-111.000.

Fieldcrest Mills, Inc.: *See*—
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Fields, Grover G., to CBS Inc. Guitar and adjustable mute therefor. 3,956,962, Cl. 84-267.000.

Fields, Joe C., Jr. Heating and cooling system. 3,956,902, Cl. 62-3.000.

Fields, Larry D.: *See*—
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Fienup, James R.; and Chu, David Chau-Kwong, to Leland Stanford University, The Board of Trustees of the. Multiemulsion transparency providing separate phase and amplitude control. 3,957,353, Cl. 350-162.0SF.

Figuli, Edward Stephen: *See*—
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Filter, Harold E.; and Stevens, Don L., to Dow Chemical Company, The. Propellant compositions having carboxyl containing binder cured with a glycidyl thioether. 3,957,551, Cl. 149-19.500.

Finnigan, Joseph C. Attachment for a vehicle shoulder harness. 3,957,282, Cl. 280-744.000.

Fioriti, Joseph Anthony: *See*—
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Fischbach, Wolfgang, to Heinrich Baumgarten, Eisen- und Biechwarenfabrik. Handle for pots and receptacles. 3,956,792, Cl. 16-114.00A.

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Fischer, Roman; Overwien, Hermann; and Nissen, Axel, to BASF Aktiengesellschaft. Recovery of pure 2-methyl-2-hydroxy-heptanone-6. 3,957,730, Cl. 260-594.000.

Fisher, Phillip Andrew: *See*—
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Fisons Limited: *See*—
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Fissolo, Maria Franca. Process for the production of a chocolate sweet containing an inner sugar crust. 3,958,024, Cl. 426-282.000.

Flamholz, Alexander L.: *See*—
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Fleck, Charles Jacques; De Pizzol, Jurg Max; and Tolar, Peter, to CPC International Inc. Process for the production of fat containing food. 3,958,031, Cl. 426-579.000.

Fleming, Robert W.; and Sill, Arthur D., to Richardson-Merrell Inc. Antiviral compositions containing bis-basic ketones of thioxanthene. 3,957,988, Cl. 424-248.000.

Fleming, Robert W.; Sill, Arthur D.; and Sweet, Francis W., to Richardson-Merrell Inc. Antiviral compositions containing bis-basic ketones of xanthene and xanthen-9-one. 3,957,989, Cl. 424-248.000.

Fleming, Robert W.: *See*—
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Fogg, Orvel Douglas; and Severson, Eugene Kenneth, to Hewlett-Packard Company. Protection circuitry for cathode ray tubes. 3,958,152, Cl. 315-381.000.

Foglio, Maurizio: *See*—
Arcari, Giuliana; Bernardi, Luigi; Bosisio, Germano; Foglio, Maurizio; Glasser, Alfredo; and Temperilli, Aldemio, 3,957,785.

Folk, Kenneth Foster, to AMP Incorporated. Method and apparatus for positioning individual leads utilizing an improved template. 3,956,822, Cl. 29-628.000.

Folser, Karl: *See*—
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Food Technology, Inc.: *See—*
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Foye, John J., to Kaiser Aluminum & Chemical Corporation. Self-centering bottom block assembly for D.C. casting. 3,957,105, Cl. 164-274.000.
Fraige, Richard. Water mattress and method of manufacture. 3,957,557, Cl. 156-211.000.
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Francis, Charles, to Black and Decker Manufacturing Company, The. Cordless electric grass shear having improved blade system. 3,956,824, Cl. 30-220.000.
Franke, Hans G., to Chevron Research Company. S-Ammonium-O-hydrocarbyl-N-acyl phosphoramidothioate salt production and reaction with alkylating agent. 3,957,928, Cl. 260-978.000.
Franks, Harry E. Spark plug. 3,958,144, Cl. 313-138.000.
Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H.: *See—*
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Frater, Georg; Greuter, Hans; and Schmid, Hans, to Hoffmann-La Roche Inc. Tricyclic ketones. 3,957,878, Cl. 260-586.00G.
Frazee, James S.; and Jen, Timothy Yu-Wen, to SmithKline Corporation. Mandelamidocephalosporins with improved properties. 3,957,985, Cl. 424-246.000.
Fredericks, Robert H. Curb protection device and method. 3,957,383, Cl. 404-8.000.
Frederiksen, Thomas M.; and Dunkley, James L., to National Semiconductor Corporation. Current scaling in lateral PNP structures. 3,958,267, Cl. 357-36.000.
Freed, Meier E.; and Potoski, John R., to American Home Products Corporation. Benzobicycloalkane amine N-oxides and the salts thereof. 3,957,872, Cl. 260-571.000.
Freitag, Ludwig W., to Curt G. Joa, Inc. Apparatus for severing and sealing the ends of a multi-ply pad. 3,957,569, Cl. 156-515.000.
French, William E., to United States of America, Army. Fail safe powder temperature sensor for tank fire control system. 3,956,966, Cl. 89-41.0ME.
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Galle, Edward Louis; Kolosky, Joseph Francis; and Mayou, Joseph Leo, to Pillsbury Company, The. Method of hydroprocessing wheat. 3,958,016, Cl. 426-61.000.
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Galusha, Richard E.; Kane, William T.; Megles, John E., Jr.; and Williams, Joseph M., to Corning Glass Works. Subsurface-fortified glass laminates. 3,958,052, Cl. 428-68.000.
Ganz, Robert H.; Myers, John H.; and Waleck, Edward A., to Federal Paper Board Company, Inc. Carton opening, filling and closing apparatus. 3,956,868, Cl. 53-48.000.
Garcia, Ricardo L., to Grayhill, Inc. Miniature switch assembly. 3,958,090, Cl. 200-67.0AA.
Gardner-Denver Company: *See—*
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Gastrock, William Henry; Pankavich, John Anthony; and Carter, Spencer Douglas, to American Cyanamid Company. Phosphonium antiparasitics. 3,957,978, Cl. 424-204.000.
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Gatof, Norman; and Schravendeel, Cornelis P., to Monet Jewelers, Inc. Clasp mechanism. 3,956,804, Cl. 24-235.000.

Gatsis, John G., to Universal Oil Products Company. Two-stage hydroconversion of hydrocarbonaceous Black Oil. 3,957,622, Cl. 208-89.000.

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Gaudiano, Anthony V., to Taylor Diving & Salvage Co., Inc. Underwater breathing method and apparatus. 3,957,045, Cl. 128-142.300.

Gault, John Robert, to ACI Technical Centre Pty. Ltd. Apparatus for manufacturing plaster sheets. 3,957,407, Cl. 425-126.00R.

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Gay, Max M. Purified plant protein concentrate. 3,958,015, Cl. 426-18.000.

Gaylord, Norman G., to Champion International Corporation. Cellulose-polymer composites. 3,958,069, Cl. 428-407.000.

Gebhardt, Hans: *See*—
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Gehrmann, Klaus: *See*—
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Geiger, Friedhelm; Heimberger, Werner; and Schreyer, Gerd. Process for preparing pure chlorine. 3,957,950, Cl. 423-240.000.

Gelfand, Samuel, to Hooker Chemicals & Plastics Corporation. Substituted alpha, beta-dichlorostyrenes. 3,957,891, Cl. 260-651.00R.

Genda, Hidesaburo: *See*—
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Gesellschaft fur Kernforschung m.b.H.: *See*—
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Getts, Ronald G., to B. F. Goodrich Company, The. Stabilizer combinations of (β-aminoacrlyl compounds and phenolic compounds and stabilized compositions thereof. 3,957,721, Cl. 260-45.80N.

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Girling Limited: *See*—
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Girotti, Pierleone; Tesei, Renato; and Floris, Telemaco, to Snam Progetti S.p.A. Synthetic lubricating oils from thermal cracking or polymers having very high viscosity. 3,957,898, Cl. 260-676.00R.

Gitchel, Wayne B.: *See*—
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Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, to Food Technology, Inc. Solidified product from sorghum. 3,958,037, Cl. 426-654.000.

Glasser, Alfredo: *See*—
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Shavyrin, Vladimir Sergeevich; Gusakov, Vyacheslav Nikolaevich; Pankova, Klavdia Vasilievna; Polyakova, Nina Petrovna; Shirkaeva, Natalya Petrovna; Gorin, Valentin Nicolaevich; Golovin, Oleg Semenovich; Mastjukov, Alexei Egorovich, deceased; and Mastjukova, Maria Pavlovna, heir, 3,957,663.

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Goodwin, Max E., to Valley Tow-Rite. Sway control adaptor. 3,957,286, Cl. 280-446.00B.

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Gordon, David A.; and Seltzer, Raymond, to Ciba-Geigy Corporation. S-triazine-imide copolymers. 3,957,726, Cl. 260-47.0CP.

Gordon, Roger G., to Safe Rack, Inc. Newspaper vending machine. 3,957,175, Cl. 221-215.000.

Gorelikova, Julia Julievna: *See*—
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Gorski, Paul T., to Reliance Electric Company. Pillow block and bearing assembly. 3,957,319, Cl. 308-187.000.

Goshima, Yoshitomo; Hattori, Hiroyuki; Komaba, Shiro; and Umezawa, Kazumi, to Canon Kabushiki Kaisha. Optical system for copying sheet originals and thick orginals. 3,957,368, Cl. 355-8.000.

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Gotoh, Kazuo: *See—*
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Graniere, Richard C.; and Marshall, Patrick J., to Litton Business Systems, Inc. Document-marking machine. 3,958,270, Cl. 360-4.000.
Grant, Patrick M.; Kahn, Milton; and O'Brien, Harold A., Jr., to United States of America, Energy Research and Development Administration. Chemical isolation of ^{85}Sr from proton-irradiated Mo targets. 3,957,945, Cl. 423-2.000.
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Gray, Don N.; and Grier, John D., to Owens-Illinois, Inc. Polymeric based composition. 3,957,497, Cl. 106-48.000.
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Green, Stanley, to Lucas Electrical Company Limited, The. Motor vehicle rear lighting system. 3,958,149, Cl. 315-66.000.
Greenshields, James Nairn; Hull, George; and Tury, Bernard, to Imperial Chemical Industries Limited. Dyeing additives. 3,957,433, Cl. 8-169.000.
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Grethe, Guenter; and Uskokovic, Milan Radoje, to Hoffmann-La Roche Inc. Processes and intermediates for cis or trans 2- or 3-(1-acyl-3-vinyl-4-piperidine)acetic or propionic acid esters. 3,957,800, Cl. 260-293.880.
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Groom, George Berfert. Extrusion machine. 3,957,255, Cl. 259-185.000.
Grosch, Gottlieb W. Means for creating perforated concrete casing. 3,957,409, Cl. 425-171.000.
Grosch, Karl Alfred; Senger, Gerhard Franz-Josef; and Freudenstein, Georg, to Uniroyal Inc. Method for determining the preferred direction of rotation of a tire. 3,956,931, Cl. 73-146.000.
Grossmann, Hans-Hermann, to Hoechst Aktiengesellschaft. Substituted ureido-s-triazines. 3,957,780, Cl. 260-249.500.
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Guild, Lloyd V. Sampling of fluid. 3,956,940, Cl. 73-421.50R.
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Gutman, Arnold D., to Stauffer Chemical Company. Nitroaryl phosphonates. 3,957,926, Cl. 260-954.000.
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Hadley, Thomas A.; Grupe, Edward H.; Bergsbaken, Jack L.; and Hultman, David P., to Kimberly-Clark Corporation. Adhesive bonding of isotropic fiber webs to form pattern bonded composites. 3,958,055, Cl. 428-198.000.
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Halfon, Leon. Multipurpose boat, steering and maneuvering device therefor, and cleat device. 3,956,785, Cl. 9-6.00P.
Hall, B. Mike. Drive-up teller window protection apparatus. 3,956,997, Cl. 109-20.000.

Hall, Lewis William; and Wisotzkey, Joseph E., to Maple Press Company, The. Book and cover therefor. 3,957,287, Cl. 281-21.00R.
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Hammersmith, Albert A. Steering control for tractor grader attachments. 3,957,130, Cl. 180-159.000.
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Hanks, William J. Tennis ball retriever. 3,957,297, Cl. 294-19.00A.
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Hansen, Leo J.; and Lockery, Harry E., to Armour and Company. System and method for measuring meat tenderness. 3,956,924, Cl. 73-81.000.
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Heffner, Robert E., to Aluminum Company of America. Method for making a metal can end. 3,957,005, Cl. 113-1.00F.
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Herrington, Daniel R.; and Schwerko, Albert P., to Standard Oil Company (Ohio), The. Hydrotreating hydrocarbon feeds using amphora-shaped catalysts. 3,957,627, Cl. 208-216.000.
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Hess, Edward L., to Bethlehem Steel Corporation. Protective panel circuit. 3,958,164, Cl. 318-431.000.
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Hiller, Trueman W.; and Jarr, Klaus D., to Weil-McLain Co., Inc. System for recovering and condensing vapors. 3,956,903, Cl. 62-54.000.
Himes, James B.; Chechakli, Hysam; and Beranek, Irvin A., to Richardson Company, The. Sampling device. 3,956,921, Cl. 73-421.50R.
Hine, Gordon Leslie, to Thomas Broadbent & Sons Limited. Washer or hydro-extractors. 3,957,649, Cl. 210-376.000.
Hines, Robert S., Jr. Ventricular drainage apparatus. 3,957,050, Cl. 128-275.000.
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Hirooka, Masaaki; Fujii, Yoshikazu; Mashita, Kentaro; and Kimura, Fumiyuki, to Sumitomo Chemical Company, Limited. Alternating copolymers having functional group and process for producing same. 3,957,732, Cl. 526-90.000.
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Hitzman, Donald O., to Phillips Petroleum Company. Recovery of cellular protein products from microbiological synthesis masses. 3,958,038, Cl. 426-656.000.
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Holtz, Leonard, to Turn-Up, Inc. Rotatable hanging device. 3,957,242, Cl. 248-318.000.

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Hoo, Stanley Shu-Ku, to International Business Machines Corporation. Interactive stylus sensor apparatus for gas panel display. 3,958,234, Cl. 340-324.00M.

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Horgan, John J., to United Technologies Corporation. Generator containment system. 3,958,140, Cl. 310-89.000.

Horlitz, Carl Frederick, Jr., to Combustion Engineering, Inc. Marine vapor generator having low temperature reheater. 3,956,898, Cl. 60-676.000.

Hornsby, James R., Jr. Novelty drinking straw. 3,957,202, Cl. 239-33.000.

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Johnson, John A., to Cedar Sales Company. Carton branding apparatus. 3,956,872, Cl. 53-131.000.

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Jowett, Terence W.; Knights, Anthony D. M.; and Cross, Thomas A., to United Technologies Corporation. Exhaust gas analyzer having pressure and temperature compensation. 3,958,122, Cl. 250-346.000.

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Kaempen, Charles E., to Kaempen Industries, Inc. Apparatus for making composite structures. 3,957,416, Cl. 425-470.000.

Kaempen Industries, Inc.: *See*—
Kaempen, Charles E., 3,957,416.

Kaeppeli, Viktor, to Sandoz Ltd. Basic styryl dyes free from sulphonic acid groups, their production and use. 3,957,767, Cl. 260-240.900.

Kagaya, Ichiro: *See*—
Narita, Shigeyoshi; Naganishi, Hirosuke; Yokouchi, Akiyoshi; and Kagaya, Ichiro, 3,957,578.

Kahn, Milton: *See*—
Grant, Patrick M.; Kahn, Milton; and O'Brien, Harold A., Jr., 3,957,945.

Kaiser Aluminum & Chemical Corporation: *See*—
Foye, John J., 3,957,105.

Kalafus, Edward F.: *See*—
van Gils, Gerard E.; and Kalafus, Edward F., 3,958,060.

Kallestad Laboratories, Inc.: *See*—
Murray, Dennis M., 3,957,436.

Kalopissis, Gregoire; Abegg, Jean-Louis; Ghilardi, Guiliana; and de Beaulieu, Henri Philippe, to L'Oreal. N-Morpholinomethyl-N-'-substituted ethyl and propylureas. 3,957,774, Cl. 260-246.00B.

Kamei, Tatsuya; and Hosokawa, Yoshikazu, to Hitachi, Ltd. Thyristor highly proof against time rate of change of voltage. 3,958,268, Cl. 357-38.000.

Kameoka, Kimitaka: *See*—
Ohi, Reiichi; Adachi, Keiichi; Katoh, Norihiko; Kameoka, Kimitaka; Sugiyama, Mitsunori; and Aono, Toshiaki, 3,957,491.

Kametaka, Norio: *See*—
Ishioka, Ryoji; Kametaka, Norio; and Marumo, Kuniomi, 3,957,804.

Kaminski, David C., to Dana Corporation. Universal control system interface. 3,957,333, Cl. 339-32.00R.

Kan, Zyozi: *See*—
Miyamoto, Haruo; Igami, Ikuo; Uehara, Masaru; Fujita, Hideo; Itoh, Hirotaka; and Kan, Zyozi, 3,957,573.

Kanda, Yoshihiro: *See*—
Fujiyama, Yoshio; Kanda, Yoshihiro; and Matsuda, Hajime, 3,957,969.

Kane, William T.: *See*—
Galusha, Richard E.; Kane, William T.; Megles, John E., Jr.; and Williams, Joseph M., 3,958,052.

Kanner, Bernard: *See*—
Prokai, Bela; and Kanner, Bernard, 3,957,842.

Kanno, Chikashi: *See*—
Tanno, Seikichi; Kohkame, Hisashi; and Kanno, Chikashi, 3,957,916.

Kansas City Southern Railway Company, The: *See*—
Johnson, Edwin O.; and Carter, Thomas S., 3,957,201.

Kanzaka, Yoshihiro, to Yoshida Kogyo Kabushiki Kaisha. Rack for adjustable fastening device. 3,956,802, Cl. 24-206.00B.

Kanzaki, Yukio: *See*—
Tamachi, Yoshihiro; Kanzaki, Yukio; Hondo, Kazunori; and Uchida, Shigeru, 3,957,471.

Karasinski, Frederick: *See*—
Loy, Fred W.; Harms, William J.; Wojahn, Charles W.; and Karasinski, Frederick, 3,957,092.

Karazija, Arvin, to Allis-Chalmers Corporation. Closed center hydraulic system for lift trucks. 3,956,891, Cl. 60-413.000.

Karoll, Elizabeth A.: *See*—
Evers, William J.; Heinsohn, Howard H., Jr.; Mayers, Bernard J.; and Karoll, Elizabeth A., 3,958,029.

Karrer, Friedrich; and Farooq, Saleem, to Ciba-Geigy Corporation. Ether derivatives of diphenylmethanes. 3,957,885, Cl. 260-613.00R.

Kashio, Toshio, to Casio Computer Co., Ltd. Character printing device. 3,957,151, Cl. 197-49.000.

Kashio, Toshio, to Casio Computer Co., Ltd. Ink jet type character recording apparatus. 3,958,252, Cl. 346-75.000.

Kassel, Karl: *See*—
Muhlen, Peter; and Kassel, Karl, 3,957,090.

Kasulanis, Charles Francis: *See*—
Fabian, Arthur C.; Genzer, Jerome D.; Kasulanis, Charles Francis; Shavel, John, Jr.; and Zinnes, Harold, 3,957,772.

Kato, Hisakatsu: *See*—
Yamada, Koichi; Yoshihara, Masao; and Kato, Hisakatsu, 3,957,947.

Kato, Kinpei: *See*—
Hashimoto, Yoshinobu; Kato, Kinpei; and Sato, Nobuo, 3,958,008.

Kato, Yasuyuki: *See*—
Iwahashi, Shunji; Morizane, Fukuichi; and Kato, Yasuyuki, 3,957,921.

Katoh, Norihiko: *See*—
Ohi, Reiichi; Adachi, Keiichi; Katoh, Norihiko; Kameoka, Kimitaka; Sugiyama, Mitsunori; and Aono, Toshiaki, 3,957,491.

Katrapat AG: *See*—
Jung, Werner, 3,957,084.

Katsube, Shizuko; and Katsube, Yoshiyuki, to Agency of Industrial Science & Technology. Method for manufacture of reflection-proof film. 3,958,042, Cl. 427-162.000.

Katsube, Yoshiyuki: *See*—
Katsube, Shizuko; and Katsube, Yoshiyuki, 3,958,042.

Katz, Ira: *See*—
Wilson, Richard Arnold; Katz, Ira; Vock, Manfred H.; and Shuster, Edward J., 3,958,030.

Katz, Seymour; and Shea, Michael M., to General Motors Corporation. Carbon purification process. 3,957,958, Cl. 423-461.000.

Katzen, Raphael: *See*—
Hokanson, Allan E.; Katzen, Raphael; and Button, Edward F., 3,957,951.

Kauffman, Ronald D.; Koppenhaver, Bennett L.; and Schneider, Fred J., to Western Electric Company, Inc. Methods of and apparatus for thermocompression bonding with a compensating system. 3,957,185, Cl. 228-106.000.

Kauffman, William J., to Armstrong Cork Company. Isocyanurate compounds and preparative processes. 3,957,778, Cl. 260-248.0NS.

Kaufman, Lance R., to Gentron Corporation. High power thick film circuit with overlapping lead frame. 3,958,075, Cl. 174-16.0HS.

Kawada, Mitsuru: *See*—
Morimoto, Hiroshi; Imada, Isuke; Watanabe, Masazumi; and Kawada, Mitsuru, 3,957,836.

Kawaguchi, Hideaki, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process for preparing shaped article. 3,957,941, Cl. 264-234.000.

Kawaguchi, Hiroshi: *See*—
Tanizaki, Yoshiharu; Kawaguchi, Hiroshi; and Minagawa, Kenichiro, 3,957,667.

Kawahara, Tetsuyo: *See*—
Kitaguchi, Hiroshi; Nakamura, Katsuya; Ueda, Tsutomu; Kawahara, Tetsuyo; and Nakamura, Mamoru, 3,957,917.

Kawakami, Koichi; and Osaki, Tatsuo, to Yoshida Kogyo Kabushiki Kaisha. Apparatus for feeding slide fastener parts. 3,956,812, Cl. 29-207.5SL.

Kawasaki, Fumiko, legal representative: *See*—
Miyayama, Shigeru; and Kawaskai, Jiro, deceased, 3,956,910.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Kobayashi, Toshiji; and Takahashi, Yutaka, 3,957,111.

Kawasaki Steel Corporation: *See*—
Akutsu, Shoji; Watanabe, Yasumasa; Mashino, Yasuhiko; Chaki, Tomohiro; and Fujita, Masakazu, 3,958,128.

Kawashima, Teruaki, to Yoshida Kogyo Kabushiki Kaisha. Automatically locking slider for slide fasteners. 3,956,800, Cl. 24-205.14R.

Kawaskai, Jiro, deceased: *See*—
Miyayama, Shigeru; and Kawaskai, Jiro, deceased, 3,956,910.

Kay, Edward Leo: *See*—
Lawson, David Francis; and Kay, Edward Leo, 3,957,723.

Kearney-National, Inc.: *See*—
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Keenan, John Francis Edmund: *See*—
Hewitt, Brian; Hobday, Cyril; Jack, James; and Keenan, John Francis Edmund, 3,957,430.

Keene Corporation: *See*—
Haack, William M., 3,957,593.

Kellerman, Jack F., to Hoerner Waldorf Corporation. Corner pad. 3,957,196, Cl. 229-14.00C.

Kelly, Austin T., to Weston Instruments, Inc. Offset control in autozeroing circuits for analog-to-digital converters. 3,958,236, Cl. 340-347.0NT.

Kelly, Charles A.: *See*—
Irick, Gether, Jr.; and Kelly, Charles A., 3,957,813.

Kelly, Joseph F.: *See*—
Hepworth, George; and Kelly, Joseph F., 3,957,098.

Kelly, Kenneth Wayne: *See*—
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Kemeny, Julius: *See*—
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Kemmenoe, Adrian Victor: *See*—
Ferres, Harry; Kemmenoe, Adrian Victor; and Best, Desmond John, 3,957,759.

Kempel, John J., to Garland Manufacturing Company. Bi-fold door assembly. 3,957,102, Cl. 160-206.000.

Kendall-Smith, Brian J.: *See*—
Ferriday, John E.; Kendall-Smith, Brian J.; and Bradley, Michael L., 3,957,700.

Kennecott Copper Corporation: *See*—
Wilder, Thomas C.; and Galin, Walter E., 3,957,485.
Kennedy, Guy H., Jr. Thermodynamic kite. 3,957,228, Cl. 244-33.000.
Kenner, M. Beatrice. Carrier attachment for invalid walkers. 3,957,071, Cl. 135-47.000.
Kent, James Eldon. Collapsible fishing. 3,956,846, Cl. 43-21.200.
Kerko, David J.: *See*—
DeMunn, Clark V.; Kerko, David J.; and Westwig, Ralph A., 3,957,499.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Brixy, Heinz, 3,956,936.
Kerr, Edwin R.: *See*—
Dorawala, Tansukhlal G.; Estes, John H.; and Kerr, Edwin R., 3,957,682.
Kerseg, Kurt C., to Multifid Corporation. Method and apparatus for cutting and forming planar material. 3,956,917, Cl. 72-337.000.
Kerst, Al F., to Monsanto Company. Substituted ethane diphosphonic acids and salts and esters thereof. 3,957,858, Cl. 260-502.40P.
Kerstetter, Donald R.: *See*—
Buescher, William E.; and Kerstetter, Donald R., 3,958,146.
Kery, Ervin. Art of manufacturing needlepointed accessories. 3,957,099, Cl. 150-28.00R.
Kerzee, Richard; McCollum, Robert W.; and Young, Carter R., to Otis Engineering Corporation. Method and apparatus for treating wells. 3,957,115, Cl. 166-297.000.
Kesting, Robert E., to Chemical Systems Incorporated. Microporous polyester membranes and polymer assisted phase inversion process for their manufacture. 3,957,651, Cl. 210-490.000.
Ketterer, Stanley Joseph; and Ivanko, Francis, to Singer Company, The. Hand-operated lock stitch sewing machine. 3,957,004, Cl. 112-169.000.
Khesin, Arkady Yakovlevich: *See*—
Bramberga, Velta Mikelevna; Grendze, Teodor Arvidovich; Plegere, Daina Arvidovna; Khesin, Arkady Yakovlevich; and Smiltniex, Etil Kharaldovich, 3,957,034.
Kiang, John Chien Kuen. Stencil printer. 3,956,984, Cl. 101-124.000.
Kichline, Thomas P.; and Kranz, Allen H., to Monsanto Company. Novel sodium aluminum phosphate cheese emulsifiers. 3,957,679, Cl. 252-351.000.
Kiehart, Lawrence Robert: *See*—
Colasanti, Arduino; Kiehart, Lawrence Robert; and Levasseur, Dornis L., 3,957,223.
Kiener, Josef; and Lutz, Eugen. Banderolling apparatus. 3,956,873, Cl. 53-198.00R.
Kiener, Volker: *See*—
Wurmb, Rolf; Werner, Dietmar; Wunsch, Gerd; Kiener, Volker; and Schwarz, Wolfgang, 3,957,927.
Kikuchi, Katsutoshi: *See*—
Tomita, Tadayoshi; Kikuchi, Katsutoshi; and Sakamoto, Takayuki, 3,957,681.
Kilgore, Colin H.; and Wolff, Norman P., to Aluminum Company of America. Soldered joint and method. 3,957,289, Cl. 285-22.000.
Kim, Seun Kyung. Vehicular pollution control muffler. 3,957,467, Cl. 55-256.000.
Kimball International, Inc.: *See*—
Slaats, Mathew A.; and Slayton, J. Richard, 3,957,239.
Kimberly-Clark Corporation: *See*—
Hadley, Thomas A.; Grupe, Edward H.; Bergsbaken, Jack L.; and Hultman, David P., 3,958,055.
Kimura, Fumiyuki: *See*—
Hirooka, Masaaki; Fujii, Yoshikazu; Mashita, Kentaro; and Kimura, Fumiyuki, 3,957,732.
Kindler, Horst: *See*—
von Brachel, Hanswilli; Heinrich, Ernst; Grawinger, Otto; Hintermeier, Karl; and Kindler, Horst, 3,957,749.
Kine, Masayoshi, to Shimano Industrial Company, Limited. Automatic adjusting device for a bicycle. 3,957,138, Cl. 188-196.00F.
King Industries, Inc.: *See*—
Thielcke, George W., 3,957,859.
King, Paul A.: *See*—
Assarsson, Per G.; and King, Paul A., 3,957,605.
Kinoshita, Kazuhisa: *See*—
Mimino, Tohru; Kinoshita, Kazuhisa; Shinoda, Takayuki; Oki, Syuji; and Nagao, Akira, 3,957,545.
Kiscaden, Roy W.: *See*—
Anderson, Joel M.; Wescott, Kermit R.; Hobbs, Milton M.; and Kiscaden, Roy W., 3,956,883.
Kise, Mearl A.: *See*—
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Kiseda, James R.: *See*—
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Kishimoto Sangyo Co., Ltd.: *See*—
Nishino, Hiroshi; Maruyama, Hiroshi; and Masuda, Masaki, 3,957,838.
Kitaguchi, Hiroshi; Nakamura, Katsuya; Ueda, Tsutomu; Kawahara, Tetsuyo; and Nakamura, Mamoru, to Nippon Zeon Co., Ltd. Resin composition for shaping information carrier. 3,957,917, Cl. 260-884.000.
Kitano, Shin; and Momose, Yutaka, to Aisin Seiki Co., Ltd. Clutch controlling apparatus. 3,957,145, Cl. 192-13.00R.
Kitayama, Minoru: *See*—
Umezono, Akimi; Kitayama, Minoru; Yamaguchi, Susumu; and Odashima, Hisao, 3,957,673.
Kitzing, Rainer: *See*—
Stauner, Thomas; Kitzing, Rainer; Hagen, Remon; and Boragine, Carlo, 3,958,050.
Klara, Charles J.: *See*—
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Klauke, Erich: *See*—
Rohe, Lothar; Schramm, Jurgen; Klauke, Erich; Eue, Ludwig; and Schmidt, Robert Rudolf, 3,957,865.
Kleeberg, Wolfgang; Rubner, Roland; and Bartel, Wieland, to Siemens Aktiengesellschaft. Method for the preparation of relief structures. 3,957,512, Cl. 96-35.100.
Kleiman, Joseph P., to Ethyl Corporation. Stabilized vinylidene halide. 3,957,892, Cl. 260-652.50R.
Klein, Gerald I.; and Steigerwald, Thomas E., to United States of America, Navy. Frequency-sensitive attenuator. 3,958,194, Cl. 333-81.00B.
Kleiner, Eduard Karl; and Dexter, Martin, to Ciba-Geigy Corporation. Vinyl ester polymers containing hindered phenolic groups. 3,957,920, Cl. 260-897.00B.
Klemm, Kurt; Schoetensack, Wolfgang; and Prusse, Wolfgang, to Byk Gulden. Aryl-substituted piperazinyl-alkylamino-uracils, -uracil ethers and -uracil thioethers and method for their production. 3,957,786, Cl. 260-256.40C.
Klenik, Ralph L., Jr.; and Dyar, Ralph E., to Sperry Rand Corporation. Drawer cabinet anti-tip device. 3,957,324, Cl. 312-218.000.
Kletschka, Harold D.: *See*—
Rafferty, Edson Howard; and Kletschka, Harold D., 3,957,389.
Klinkner, Hans-Guido; and Culmann, Gunter, to Saarbergwerke Aktiengesellschaft. Method for consolidating coal and/or rock in mining. 3,956,900, Cl. 61-36.00R.
Klint, Robert V., to General Electric Company. Chemically augmented electrical fuse. 3,958,206, Cl. 337-406.000.
Klippel, Friedrich: *See*—
Pai, Panemangalore S.; Petersen, Harro; and Klippel, Friedrich, 3,957,431.
Klotzer, Sieghart; and Moisar, Erik, to AGFA-Gevaert, A.G. Photographic emulsion containing unfogged, heterodisperse layered silver halide grains having a prodominantly bromide core and total chloride content less than 30 mole percent. 3,957,488, Cl. 96-64.000.
Kloweit, Kenneth R. Stylus for sign-making machine. 3,956,828, Cl. 33-23.00K.
Klund, William E.: *See*—
Andrews, Daniel E., Jr.; Klund, William E.; and Isaak, Robert D., 3,958,214.
Knepper, Allen Houpt: *See*—
Beard, Lloyd Ronald; and Knepper, Allen Houpt, 3,958,205.
Knibbe, David E.; and Pitham, David C. S., to Shell Oil Company. Offshore apparatus for carrying out operations in an offshore well. 3,957,112, Cl. 166-.500.
Knights, Anthony D. M.: *See*—
Jowett, Terence W.; Rabinowitz, Charles Myron; Knights, Anthony D. M.; and Cross, Thomas A., 3,957,372.
Jowett, Terence W.; Knights, Anthony D. M.; and Cross, Thomas A., 3,958,122.
Knoll A.G. Chemische Fabriken: *See*—
Treiber, Hans-Jorg; and Dengel, Ferdinand, 3,957,845.
Knop, Karl, to RCA Corporation. Diffractive subtractive color filtering technique. 3,957,354, Cl. 350-162.0SF.
Knopp, Paul V.; and Gitchel, Wayne B., to Sterling Drug Inc. Wastewater purification. 3,957,632, Cl. 210-5.000.
Knorr-Bremse GmbH: *See*—
Falke, Erich, 3,957,314.
Hochhuth, Curt; Pollinger, Hans; Gebhardt, Hans; and Popescu, Corneliu Mircea, 3,957,139.
Knyazhansky, Mikhail Isaakovich: *See*—
Tsibizov, Jury Nikolaevich; Pozharsky, Fedor Tikhonovich; Simonov, Andrei Mikhailovich; Knyazhansky, Mikhail Isaakovich; and Strjukov, Mikhail Borisovich, 3,957,810.
Kobayakawa, Masaki; Yawata, Kazufumi; Murayama, Hideo; and Matsusaki, Itsuo, to Nippon Electric Kagoshima, Ltd. Multi-digit luminescence display tube having means for supplying a positive or zero voltage to a selected grid to suppress luminescence of anode segments covered thereby. 3,958,150, Cl. 315-169.0TV.
Kobayashi, Hidehiko; Genda, Hidesaburo; and Ishikawa, Toshio, to Asahi Kasei Kogyo Kabushiki Kaisha. Method of free radical photography utilizing a short light flash for exposure. 3,957,513, Cl. 96-48.0QP.
Kobayashi, Makio: *See*—
Senjo, Teizo; and Kobayashi, Makio, 3,957,949.
Kobayashi, Soichi; and Izawa, Tatsuo, to Nippon Telegraph and Telephone Public Corporation. Method for manufacturing an optical fibre. 3,957,474, Cl. 65-3.00A.
Kobayashi, Toshiji; and Takahashi, Yutaka, to Kawasaki Jukogyo Kabushiki Kaisha. Apparatus for cooling solids of high temperature. 3,957,111, Cl. 165-96.000.
Koch, George R.; and Petersen, Carl T., to Etec Corporation. Method and apparatus for SEM specimen coating and transfer. 3,958,124, Cl. 250-442.000.

Kochetkova, Nadezhda Sergeevna: *See*—
Nesmeyanov, Alexandr Nikolaevich; Bogomolova, Ljubov Grigorievna; Kochetkova, Nadezhda Sergeevna; Vilchevskaya, Vera Dmitrievna; Palitsyn, Nikanor Petrovich; Gorelikova, Julia Julievna; Andrianova, Irina Gennadievna; Belozerova, Olga Petrovna; and Sjundjukova, Vera Khusainovna, 3,957,841.

Koga, Toshihiro: *See*—
Fujii, Fumio; Kurahara, Koji; Igata, Akitoshi; and Koga, Toshihiro, 3,957,680.

Kohkame, Hisashi: *See*—
Tanno, Seikichi; Kohkame, Hisashi; and Kanno, Chikashi, 3,957,916.

Kohn, Georg Bernhard. Method and device for the peripheral heating of mineral substances in shaft furnaces with fluid fuels and air. 3,957,422, Cl. 432-3.000.

Kolaian, Jack H.: *See*—
Kablaoui, Mahmoud S.; and Kolaian, Jack H., 3,957,660.

Kollmeyer, Herman Richard. Dual function pressure transducer. 3,956,920, Cl. 73-398.0AR.

Kollner, Friedrich: *See*—
Otto, Friedrich; Tilch, Heinrich; Kollner, Friedrich; and Rogalski, Manfred, 3,957,215.

Kolosky, Joseph Francis: *See*—
Galle, Edward Louis; Kolosky, Joseph Francis; and Mayou, Joseph Leo, 3,958,016.

Kolsun, George J.: *See*—
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Komaba, Shiro: *See*—
Goshima, Yoshitomo; Hattori, Hiroyuki; Komaba, Shiro; and Umezawa, Kazumi, 3,957,368.

Komancheck, John J., to Sperry-New Holland. Detachable mount for concave of axial flow combine. 3,957,058, Cl. 130-27.00J.

Kondou, Sigehiro: *See*—
Oka, Akira; Minami, Noriaki; Kondou, Sigehiro; Nakatsuka, Hirosi; Egasira, Hirosi; Hirayama, Mamoru; Hayasi, Yasunori; and Otsukawa, Kazunobu, 3,958,103.

Koninklijke Nederlandsche Gist-en Spiritusfabriek N.V.: *See*—
Weber, Hubert Antonius, deceased; and Molenaar, Adrianus Pieter, 3,957,972.

Koppenhaver, Bennett L.: *See*—
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Koppers Company, Inc.: *See*—
Buzbee, Lloyd R.; and Lake, Robert D., 3,957,906.
Oberley, William J., 3,957,494.

Korb, Donald R.: *See*—
Mancini, William L.; Korb, Donald R.; and Refojo, Miguel F., 3,957,362.

Korkis, George N., to American Cyanamid Company. Improved shampoo containing an ester of polyethylene glycol, urea or thiourea and a polysiloxane. 3,957,970, Cl. 424-70.000.

Korner, Peter: *See*—
Reinsch, Herbert; Korner, Peter; and Obermann, Horst, 3,957,355.

Kornis, Gabriel, to Upjohn Company, The. Alkyl and haloalkylpyrazoles, compositions and process. 3,957,480, Cl. 71-92.000.

Kosakai, Michiko. Brooch serving as a glasses hanger. 3,956,795, Cl. 24-3.00R.

Kosaki, Kunio: *See*—
Teranishi, Takeshi; Ishiki, Tatuo; and Kosaki, Kunio, 3,957,495.

Kotcharian, Michel, to Technigaz. Supporting device for a rigid vehicle-borne heat-insulated tank. 3,957,170, Cl. 220-9.0LG.

Kotthaus & Busch: *See*—
Hauschke, Manfred; Hesse, Walter; and Meissner, Volker, 3,956,818.

Koutsky, L. John; and Carter, John W., to Sears Manufacturing Company. Restraint for a vehicle seat and seat belt. 3,957,304, Cl. 297-385.000.

Kraeutle, Karl J., to United States of America, Navy. Method for measuring suitability of aluminum for use in certain propellants. 3,958,176, Cl. 324-65.00R.

Krafico Corporation: *See*—
Stearns, Charles K.; and Singleton, Andrew D., 3,958,035.

Krainov, Ivan Stepanovich: *See*—
Bobolev, Alexandr Vasilievich; Tatikolov, Alexandr Sergeevich; Lukashina, Natalya Nikolaevna; Krainov, Ivan Stepanovich; and Emanuel, Nikolai Markovich, 3,957,690.

Kranz, Allen H.: *See*—
Kichline, Thomas P.; and Kranz, Allen H., 3,957,679.

Krapcho, John; and Turk, Chester Frank, to E. R. Squibb & Sons, Inc. 2-Aminoalkyl-3,3a,4,5,6,7-hexahydro-3-phenyl-7(phenylmethylene)-2H-indazoles. 3,957,762, Cl. 260-240.00D.

Krekeler, Claude B., to Cincinnati Mine Machinery Company, The. Pusher-type chain for conveyor means. 3,957,153, Cl. 198-168.000.

Kreutzfeldt, Richard L.: *See*—
Hayes, William B., Jr.; and Kreutzfeldt, Richard L., 3,957,539.

Kriese, Manfred; Kuhl, Jurgen; Neumann, Siegfried; and Torge, Reimund, to Carl Zeiss-Stiftung. Apparatus for obtaining samples of dusts for analysis by spectrochemical examination. 3,957,374, Cl. 356-85.000.

Krock, Friedrich Wilhelm; and Neeff, Rutger, to Bayer Aktiengesellschaft. Anthraquinone dyestuffs. 3,957,822, Cl. 260-340.300.

Kronish, Donald P.; and Young, William D., to Warner-Lambert Company. Detection of beta-galactosidase producing micro-organisms. 3,957,584, Cl. 195-103.50R.

Kronogard, Sven-Olof, to United Turbine AB and Co., Kommanditbolag. Gas turbine plant where a circulating medium is indirectly heated. 3,956,899, Cl. 60-682.000.

Kroontje, Wiggert: *See*—
Jack, Alexander Gray; and Kroontje, Wiggert, 3,958,145.

Krug, Herbert: *See*—
Dockner, Toni; and Krug, Herbert, 3,957,874.

Kruse, Friedel; Wahle, Gunter; Erdmann, Otto; and Rudszinat, Willy, to Hauni-Werke Korber & Co., KG. Machine for packing cigarettes or the like. 3,956,870, Cl. 53-55.000.

Krzaklewski, Stanislaw; Reszczynski, Andrzej; and Suski, Henryk, to Akademia Medyczna We Wroclawiu. Spatial intrauterine contraceptive insert. 3,957,042, Cl. 128-130.000.

Kubela, Rudolf; and Hughes, Lise A., to Delmar Chemicals Limited. Novel cyclopentene and cyclopentane derivatives. 3,957,795, Cl. 260-293.650.

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Kulikowski, Adolf. Combined rear view mirror and sunvisor. 3,957,357, Cl. 350-304.000.

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Kunz, Max; and Christiansen, Kurt, to Von Roll AG. Flow-sensitive pressure limiting valve for hydraulic equipment. 3,957,075, Cl. 137-117.000.

Kuo, Ted L. C., to Thomas & Betts Corporation. Method of making an electrical connection between an aluminum conductor and a copper sleeve. 3,956,823, Cl. 29-628.000.

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Kupiek, Heinrich; and Brackemann, Gerd, to Montanhydraulik GmbH & Co. KG. Multiple stage hydraulic telescopic cylinder device. 3,956,970, Cl. 91-173.000.

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Kurita, Tetsuya: *See*—
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Lachnit-Fixson, Ursula; and Pitchford, Alan G., to Schering Aktiengesellschaft. Method for contraception by the application of combination-type sequential preparations. 3,957,982, Cl. 424-238.000.
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Lambert, Everette M.; and Ball, Richard L., to Drake, Crandell & Batchelder. Apparatus for water tight seaming of flexible thermoplastic sheet material. 3,957,564, Cl. 156-497.000.
Lambert, George L., III, to Kearney-National, Inc. Electric connector apparatus and method. 3,957,332, Cl. 339-12.00R.
Lamberti, Vincent, to Lever Brothers Company. Sulfosuccinate derivatives as detergent builders. 3,957,775, Cl. 260-247.10E.
Lambly, Charles A. R.; and Draney, Charles T. Method of removing tar sands from subterranean formations. 3,957,308, Cl. 299-14.000.
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Land, Edwin H.; and Baker, Philip G., to Polaroid Corporation. Reflex camera and viewing device and attachment therefor. 3,958,261, Cl. 354-295.000.
Lane, Henry G. Climbing device. 3,957,135, Cl. 182-136.000.
Lang, Karl, to Siemens Aktiengesellschaft. Sealing arrangement for a machine with a cover insulated against structure-borne sound. 3,957,274, Cl. 277-4.000.
Langguth, Arthur F., to United States of America, Navy. Vacuum multiplier. 3,957,296, Cl. 294-66.00R.
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Latimer, Floyd E., to Cav-Pro, Inc. Stable avocado base preparation. 3,958,036, Cl. 426-628.000.
Lattur, Vincent, to Automated Packaging Systems, Inc. Packaging method and apparatus. 3,956,866, Cl. 53-29.000.
Lauchenauer, Alfred E., to Raduner & Co., AG. High temperature process for modifying thermoplastic filamentous material. 3,957,936, Cl. 264-53.000.
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Lawson, David Francis; and Kay, Edward Leo, to Firestone Tire & Rubber Company, The. Flame and smoke retardants for polyvinyl chloride. 3,957,723, Cl. 260-45.75W.
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Le Blanc, Walter J., to B. F. Goodrich Company, The. Automatic adjuster with cutter for friction couplings. 3,957,146, Cl. 192-111.00A.
Le Bon, Georges, to Compagnie General d'Electro Ceramique — Ceraver. Method of cementing together the cap, body, and stem of electrical insulators. 3,957,560, Cl. 156-293.000.
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Lecordier, Michel G. Method and apparatus for maintaining the axial alignment between a tube and a machine movable therein. 3,956,995, Cl. 104-138.00G.
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Lee, Charles A.; Furbeck, Warren R.; and Granberg, Frederick M., to International Paper Company. Method and apparatus for making a molded pulp product with a liquid impervious layer integrally secured thereon. 3,957,558, Cl. 156-212.000.
Lee, James Goon Nam; and O'Hara, Christopher James. Transmitter output monitor. 3,958,244, Cl. 343-106.00D.
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Leone, Luigi; and Casagrande, Fulvio, to Ciba-Geigy Corporation. Disinfection and sterilisation of mussels, crustacea and fish. 3,958,026, Cl. 426-332.000.
Lepore, Paul D.; and Hahn, Peter A., to W. R. Grace & Co. Ammonium and potassium isobutyrates as pathogen growth inhibitors and growth stimulators. 3,958,009, Cl. 424-317.000.
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Lieberman, Abraham Buddy. Apparatus for producing high-speed production of a pressure generating product. 3,957,413, Cl. 425-371.000.
Light, Ronald R.; Gray, Theodore F., Jr.; and Joyner, Frederick B., to Eastman Kodak Company. Molding composition. 3,957,706, Cl. 260-22.00R.
Limburg, William W., to Xerox Corporation. Active matrix and intrinsic photoconductive polymer. 3,957,725, Cl. 260-46.50R.
Lin, Tenhon. Foldable plastic and paper container assembly. 3,957,195, Cl. 229-14.00B.
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Lindstrom, Olle; and Lundblad, Erik, to Allmanna Svenska Elektriska Aktiebolaget. Method for preparing diamonds for use with grinding wheels. 3,957,461, Cl. 51-295.000.
Linkohr, Rolf; and Plust, Heinz G., to Deutsche Automobilgesellschaft mbH, Firma. Diaphragm for the separation of hydrogen from hydrogen-containing gaseous mixtures. 3,957,534, Cl. 136-86.00D.
Linton, Robert W., to Pittsburgh Corning Corporation. Acid and heat-resistant mortars for cellular glass compositions and products therefrom. 3,957,519, Cl. 106-85.000.
Linton, Robert W., to Pittsburgh Corning Corporation. Acid and heat-resistant mortars for cellular glass compositions and products therefrom. 3,957,520, Cl. 106-85.000.
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MacMillan, Charles W. Wheel alignment instrument and measurement method. 3,956,830, Cl. 33-337.000.

Macur, Robert A., to General Electric Company. Miniature probe having multifunctional electrodes for sensing ions and gases. 3,957,613, Cl. 204-195.00M.

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Magdo, Steven, to International Business Machines Corporation. Space-charge-limited phototransistor. 3,958,264, Cl. 357-30.000.

Magee, John Storey, Jr.: *See—*
McDaniel, Carl Vance; and Magee, John Storey, Jr., 3,957,623.

Magic Chocolate, Inc.: *See—*
Tay, Eugenia, 3,958,018.

Magnavox Company, The: *See—*
Barber, Ronald O.; and Barnes, Daniel J., 3,958,085.

Magnesium Elektron Limited: *See—*
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Maguire, Eileen: *See—*
Donovan, Lawrence P.; Maguire, Eileen; and Kadison, Leon A., 3,958,048.

Mahall, Karl: *See—*
Heyden, Rudi; Eckelt, Michael; Mahall, Karl; and Kuper, Wilfried, 3,957,712.

Maier, Gerhard, to Maschinenfabrik G. Maier KG. Rotary material removing tool with expendable blades. 3,957,094, Cl. 144-230.000.

Maier, Ludwig, to Monsanto Company. Process for imparting flame resistance to combustible material. 3,957,720, Cl. 260-45.70R.

Main, Brian Geoffrey, to Imperial Chemical Industries Limited. Organic compounds. 3,957,870, Cl. 260-562.00N.

Makita, Hisashi: *See—*
Fukui, Yukimasa; Hosoi, Teikichi; Makita, Hisashi; Mukaida, Heihachiro; and Takahashi, Toshiro, 3,957,620.

Malec, Robert E., to Ethyl Corporation. Phospho-sulfurized phenolic aldehyde amine alkylene oxide condensation product. 3,957,746, Cl. 260-125.000.

Malick, Emil A., to Phillips Petroleum Company. Method for conducting fermentation. 3,957,585, Cl. 195-109.000.

Mally, Frank X., to Guardian Electric Manufacturing Company. Blade construction for relay. 3,958,200, Cl. 335-275.000.

Mancini, William L.; Korb, Donald R.; and Refojo, Miguel F., to Corneal Sciences, Inc. Hydrogels and articles made therefrom. 3,957,362, Cl. 351-160.000.

Maness, Robert L.: *See—*
McMullen, Thomas B.; and Maness, Robert L., 3,957,509.

Mangiaracina, Charles G.: *See—*
Bouchard, Richard W.; and Mangiaracina, Charles G., 3,957,127.

Manufacture d'Appareillage Electrique de Cahors: *See—*
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Manzato, Camille B.: *See—*
Manzato, Gustave A.; and Manzato, Camille B., 3,956,882.

Manzato, Gustave A.; and Manzato, Camille B. Convertible hydrogenator and gas turbine. 3,956,882, Cl. 60-39.120.

Maple Press Company, The: *See—*
Hall, Lewis William; and Wisotzkey, Joseph E., 3,957,287.

Mardiguian, Jean, to Societe d'Etude et d'Eploitation de Marques Mar-Pha. Indane-1,3-dione derivatives. 3,957,879, Cl. 260-590.0FA.

Margnelli, Norman G., to United Technologies Corporation. Labyrinth seal structure for gas turbine engine. 3,957,277, Cl. 277-56.000.

Marin Moga, Antonio Camelo, to J. Uriach & Cia S.A. Cyclopentyl carbamide derivative and process for its production. 3,957,866, Cl. 260-553.0DA.

Marison Company, The: *See—*
Prochaska, Joseph, 3,956,914.

Markert, Jurgen: *See—*
Leutenegger, Willi; Buhler, Jakob; Markert, Jurgen; and Zurbuchen, Jacques, 3,957,429.

Markle, David A.; Buckley, Jere D.; and Casas, Raul E., to Perkin-Elmer Corporation, The. Coarse viewing system for an annular field projection system. 3,957,364, Cl. 353-28.000.

Maroni, Victor A., to United States of America, Energy Research and Development Administration. Process for recovering tritium from molten lithium metal. 3,957,597, Cl. 204-60.000.

Marritt, Clifford Russell, to Molins Limited. Ledgers for the cutting devices of cigarette and like rod-making machines. 3,956,955, Cl. 83-310.000.

Marshall, John William, to International Business Machines Corporation. Enhanced error correction. 3,958,220, Cl. 340-146.1AL.

Marshall, Patrick J.: *See—*
Graniere, Richard C.; and Marshall, Patrick J., 3,958,270.

Marston, Lloyd, to Dynatron/Bondo Corporation. Disposable putty dispenser. 3,957,176, Cl. 222-185.000.

Marteau, Jacques: *See—*
Pautrat, Rene; and Marteau, Jacques, 3,957,737.

Martin, Frederick Raymond Patrick, to Lucas Electrical Company Limited, The. Device for changing the amount of linear movement in a linkage. 3,957,260, Cl. 267-174.000.

Martin, Mendell R., to Fairchild Camera and Instrument Corporation. Method of attaching semiconductor die to package substrates. 3,956,821, Cl. 29-590.000.

Martinelli, Giovanna. Loom of the shuttleless type. 3,957,089, Cl. 139-448.000.

Martini, William R.: *See—*
Noble, Jack E.; Riggie, Peter; Emigh, Stuart G.; and Martini, William R., 3,956,895.

Martino, Germain: *See—*
Duhaut, Pierre; Martino, Germain; and Miquel, Jean, 3,957,686.

Martz, John V. Toggle release for Luger pistol. 3,956,967, Cl. 89-175.000.

Marumo, Kuniomi: *See—*
Ishioka, Ryoji; Kametaka, Norio; and Marumo, Kuniomi, 3,957,804.

Maruyama, Hiroshi: *See—*
Nishino, Hiroshi; Maruyama, Hiroshi; and Masuda, Masaki, 3,957,838.

Mascaro, Francesco: *See—*
Trevisan, Gianfranco; Mascaro, Francesco; and Brichta, Corrado, 3,958,073.

Maschinenfabrik G. Maier KG: *See—*
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Maselli, James Michael: *See—*
Lundquist, Joseph Theodore, Jr.; Maselli, James Michael; and Whitt, Dillard Glenn, 3,957,506.

Mashino, Yasuhiko: *See—*
Akutsu, Shoji; Watanabe, Yasumasa; Mashino, Yasuhiko; Chaki, Tomohiro; and Fujita, Masakazu, 3,958,128.

Mashita, Kentaro: *See—*
Hirooka, Masaaki; Fujii, Yoshikazu; Mashita, Kentaro; and Kimura, Fumiyuki, 3,957,732.

Mason, Jerry N., to United States of America, Air Force. Extendable rocket motor exhaust nozzle. 3,957,206, Cl. 239-265.330.

Mason, Lawrence D.: *See—*
Clement, Donald R.; Helber, Carl A.; and Mason, Lawrence D., 3,958,129.

Mass Transfer Limited: *See—*
Ellis, Stephen Robert Mercer; Priestley, Ronald; and McKeown, Kevin Joseph, 3,957,931.

Massey, John; Shepley, Martin Alan; Suiter, Roger N.; and Murphy, John M., to Imperial Chemical Industries Limited. Treatment of textile materials. 3,957,428, Cl. 8-111.000.

Mastjukov, Alexei Egorovich, deceased: *See—*
Shavyrin, Vladimir Sergeevich; Gusakov, Vyacheslav Nikolaevich; Pankova, Klavdia Vasilievna; Polyakova, Nina Petrovna; Shirkaeva, Natalya Petrovna; Gorin, Valentin Nicolaevich; Golovin, Oleg Semenovich; Mastjukov, Alexei Egorovich, deceased; and Mastjukova, Maria Pavlovna, heir, 3,957,663.

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Shavyrin, Vladimir Sergeevich; Gusakov, Vyacheslav Nikolaevich; Pankova, Klavdia Vasilievna; Polyakova, Nina Petrovna; Shirkaeva, Natalya Petrovna; Gorin, Valentin Nicolaevich; Golovin, Oleg Semenovich; Mastjukov, Alexei Egorovich, deceased; and Mastjukova, Maria Pavlovna, heir, 3,957,663.

Mastronardi, Pasquale J.; and Swart, Gary M., to Estey Corporation. Control means for selectively shifting storage units. 3,957,322, Cl. 312-198.000.

Masuda, Masaki: *See—*
Nishino, Hiroshi; Maruyama, Hiroshi; and Masuda, Masaki, 3,957,838.

Masuda, Takao; and Adachi, Keiichi, to Fuji Photo Film Co., Ltd. Thermodevelopable photographic material with N-haloacetamide. 3,957,493, Cl. 96-114.100.

Masuda, Takao: *See—*
Ikenoue, Shinpei; Masuda, Takao; and Satomura, Masato, 3,957,517.

Maszczynski, Kathleen K.: *See—*
van Lier, Johannes A.; and Maszczynski, Kathleen K., 3,957,696.

Matsuda, Hajime: *See—*
Fujiyama, Yoshio; Kanda, Yoshihiro; and Matsuda, Hajime, 3,957,969.

Matsuda, Tadashi; Tanaka, Kazuo; and Taura, Kazuma, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Non-combustible light-weight inorganic shaped articles and process of manufacture. 3,957,501, Cl. 106-75.000.

Matsuno, Mitsuo, to Nippon Oil Company Ltd. Method for producing 5-alkylidenenorbornene-2. 3,957,895, Cl. 260-666.0PY.

Matsuno, Nozomu: *See—*
Sano, Hiroshi; Matsuno, Nozomu; and Okina, Katsumi, 3,957,674.

Matsuo, Koichi: *See—*
Murakami, Noboru; Hirozawa, Koichiro; Ohara, Kazuo; and Matsuo, Koichi, 3,956,946.

Matsuo, Masato; and Yamakita, Hiroki, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process for preparing fire-resisting moldings. 3,957,522, Cl. 106-109.000.

Matsusaki, Itsuo: *See—*
Kobayakawa, Masaki; Yawata, Kazufumi; Murayama, Hideo; and Matsusaki, Itsuo, 3,958,150.

Matsushita Electric Works, Ltd.: *See—*
Doi, Kazuo; Murakami, Takeru; and Nakano, Yoshinobu, 3,957,903.

Mattis, Donald J., to Sun Chemical Corporation. Electrical resistance unit for ignitor plugs. 3,958,099, Cl. 219-270.000.

Maurin, Jean: *See—*
Weisang, Joseph Edouard; Szabo, Georges; and Maurin, Jean, 3,957,900.

Mauron, Gerard, to Automobiles Peugeot; and Regie Nationale des Usines Renault. Safety seat for a child. 3,957,303, Cl. 297-216.000.

Maximoff, Paul A., to Midway Mfg. Co. Electrical terminal connector with bowed and curved tines and serrations. 3,957,338, Cl. 339-258.00R.

Maydl, Paul: *See—*
Ott, Karl; and Maydl, Paul, 3,957,528.

Mayer, Edward A.; Alperstein, Martin; Brandenburg, John T.; and Mitchell, Edward, to Texaco Inc. Swirl reactor for exhaust gases. 3,957,446, Cl. 23-288.00F.

Mayer, Frederick G. Water purification apparatus. 3,957,589, Cl. 202-185.00B.

Mayers, Bernard J.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; Mayers, Bernard J.; and Karoll, Elizabeth A., 3,958,029.

Mayou, Joseph Leo: *See—*
Galle, Edward Louis; Kolosky, Joseph Francis; and Mayou, Joseph Leo, 3,958,016.

Mazzanti, Giorgio: *See—*
Natta, Giulio; Mazzanti, Giorgio; and Boschi, Giorgio, 3,957,743.

McAuley, Van A. Wide band AC modulated control networks. 3,958,179, Cl. 325-65.000.

McCarty, James C.: *See—*
Carmignani, Garibaldi M.; McCarty, James C.; and Monaco, George, 3,957,017.

McCluskey, John J.: *See—*
Wilson, Edward L.; McCluskey, John J.; Bell, Ronald Z.; Linak, Richard T.; and Armstrong, Gordon P., 3,957,556.

McCollum, Robert W.: *See—*
Kerzee, Richard; McCollum, Robert W.; and Young, Carter R., 3,957,115.

McConnell, Lorne D., to I-T-E Imperial Corporation. Fault-current limiter for high power electrical transmission systems. 3,957,329, Cl. 316-16.000.

McCormick, Michael E.; and Bhattacharyya, Rameswar. Drag reduction of water vehicles using gas created by electrolysis on electrodes attached to the hull. 3,957,008, Cl. 114-67.00A.

McCracken, Lester C. Gate barrier. 3,957,251, Cl. 256-47.000.

McDaniel, Carl Vance; and Magee, John Storey, Jr., to W. R. Grace & Co. Stable, catalytically active and coke selective zeolite. 3,957,623, Cl. 208-120.000.

McDonnell Douglas Corporation: *See—*
Boy de la Tour, Roger, 3,958,165.
Gibson, Sandra F.; and Fadler, Norman L., 3,957,583.
Sheratte, Martin B., 3,957,668.

McFarlane, Richard H. Surgical drainage tube. 3,957,054, Cl. 128-350.00R.

McGonigal, Ian, to Delta Precision Casting Co. Ltd. Pocket screen assemblies for centrifugal separators and replacement therefor. 3,957,652, Cl. 210-498.000.

McGuire, Charles H., to Motorola, Inc. Arming system safety device. 3,956,964, Cl. 89-1.50D.

McKee, Allan W., Jr.; and Witman, Jack H., to Armstrong Cork Company. Method of making chemically embossed surface coverings. 3,958,043, Cl. 427-195.000.

McKee, Allan W., Jr.; and Witman, Jack H., to Armstrong Cork Company. Chemical embossing of decorative surface coverings. 3,958,054, Cl. 428-172.000.

McKenzie, Edwin Charles, to Babcock & Wilcox Limited. Fluidised bed combustion system. 3,957,419, Cl. 431-170.000.

McKeown, Kevin Joseph: *See—*
Ellis, Stephen Robert Mercer; Priestley, Ronald; and McKeown, Kevin Joseph, 3,957,931.

McLean, Colin Douglas: *See—*
Solomon, David Henry; and McLean, Colin Douglas, 3,957,699.

McLean, Paul Douglas; and Scott, Robert Frederick, to Canadian Patents and Development Limited. Epoxy composition containing acid anhydride compound obtained from nadic methyl anhydride. 3,957,727, Cl. 260-47.0EA.

McMaster, Harold A.; and Nitschke, Norman C. Glass treating furnace. 3,957,479, Cl. 65-350.000.

McMullen, Thomas B.; and Maness, Robert L., to Xerox Corporation. Method and apparatus for removing contaminants from an electrostatic imaging surface. 3,957,509, Cl. 96-1.00R.

McNeil Laboratories, Incorporated: *See—*
Carson, John Robert, 3,957,818.
Taylor, Russell J., Jr., 3,957,991.
Taylor, Russell J., Jr., 3,957,992.
Taylor, Russell J., Jr., 3,957,993.

McReynolds, William U. Head supporting and immobilizing device. 3,957,262, Cl. 269-328.000.

McWatters, William Andrew. Dredge ladder shock mounting arrangements. 3,956,834, Cl. 37-72.000.

Mead Corporation, The: *See—*
Seaborn, Paul E., 3,956,836.

Mead, Ralph T.; Greatbatch, Wilson; and Rudolph, Frank W., to Wilson Greatbatch Ltd. Lithium-iodine battery having coated anode. 3,957,533, Cl. 136-83.00R.

Means, James E.; and Anderson, Matthew E., to United States of America, Navy. Optical, semi-active bomblet fuze. 3,956,991, Cl. 102-70.20P.

Medi-Physics, Inc.: *See—*
Winchell, Harry S.; and Hall, Thomas C., 3,957,033.

Medical Development Corporation: *See—*
Topham, Silas Charles, 3,957,051.
Topham, Silas Charles, 3,957,052.

Medtronic, Inc.: *See—*
Comben, Richard H.; and Doty, Richard L., 3,957,056.

Meginnis, Charles E. Sight glass assembly. 3,957,359, Cl. 350-319.000.

Megles, John E., Jr.: *See—*
Galusha, Richard E.; Kane, William T.; Megles, John E., Jr.; and Williams, Joseph M., 3,958,052.

Megumi, Toshiharu: *See—*
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Meier, Max: *See—*
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Meissner, Volker: *See—*
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Melin, Gerald W.: *See—*
Livingston, Wayne W.; and Melin, Gerald W., 3,957,565.

Melin, John E. Perforated animal identification tag. 3,956,840, Cl. 40-301.000.

Meng, Karl: *See—*
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 3,957,814.

Mengler, Helmut, to Hoechst Aktiengesellschaft. 3-[3',4'-Dichloro-6'-alkyl-phenyl]-Δ^2-pyrazoline derivatives and their use as optical brighteners. 3,957,815, Cl. 260-310.00D.

Mercer, Colin: *See—*
Bisset, Douglas M.; and Mercer, Colin, 3,957,884.

Merck & Co., Inc.: *See—*
Cragoe, Edward J., Jr.; and Fanelli, George M., Jr., 3,958,004.
Morse, Lewis D.; and Hammes, Paul A., 3,958,017.
Remy, David C., 3,957,871.
Rogers, Edward F.; Dybas, Richard A.; and Hannah, John, 3,957,997.

Merdes, Hartmut: *See—*
Berger, Herbert; Gall, Rudi; Merdes, Hartmut; Stach, Kurt; Sauer, Winfriede; and Vomel, Wolfgang, 3,957,766.

Meredith, Curtis L.: *See—*
Von Bodungen, George A.; and Meredith, Curtis L., 3,957,919.

Merkl, George G. Metal hydrates and salts of carboxylic acids. 3,957,598, Cl. 204-72.000.

Meron, Michael: *See—*
Cina, Baruch; Meron, Michael; Myron, Stuart Maurice; and Dror, Gidon, 3,957,542.

Merriam, Charles J., to Griffith Laboratories, Inc., The. Method of puffing moist food products using both inert non-condensible gas and vaporized moisture. 3,958,032, Cl. 426-580.000.

Merrin, Seymour, to Innotech Corporation. Electrostatic image reproducing element employing an insulating ion impermeable glass. 3,958,262, Cl. 357-2.000.

Mesch, Walter; and Wittwer, Arnold, to BASF Aktiengesellschaft. Manufacture of succinic anhydride. 3,957,830, Cl. 260-346.80R.

Messina, Benedicto U.; and Weinberger, Arnold, to International Business Machines Corporation. Reconfigurable decoding scheme for memory address signals that uses an associative memory table. 3,958,222, Cl. 340-172.500.

Messina, Benedicto U.: *See—*
Coombes, Daniel J.; and Messina, Benedicto U., 3,958,228.

Meszaros, Csilla: *See—*
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szaberenyi, Szaboles; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 3,957,777.

Metallgesellschaft Aktiengesellschaft: *See—*
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Metco, Inc.: *See—*
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Metzger, Harold W., to Fischer & Porter Co. Variable area flowmeter. 3,956,933, Cl. 73-209.000.

Metzger, Karl Georg: *See—*
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,957,779.
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,957,987.

Meudec, Henri, to Rol. Process of coating an elongated support. 3,957,942, Cl. 264-235.000.

Meulendyk, John W., to Pneumo Corporation. Stabilized hydromechanical servo system. 3,956,971, Cl. 91-384.000.

Meyer, Carl H. W.: *See—*
Ehrsam, William Friedrich; Meyer, Carl H. W.; Powers, Robert Lowell; Prentice, Paul Norman; Smith, John Lynn; and Tuchman, Walter Leonard, 3,958,081.

Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. Use of 2,6-diamino-4-substituted-1,4-dihydropyridine-3,5-dicarboxylic acid esters for effecting coronary vessel dilation and treating hypertension. 3,957,998, Cl. 424-266.000.

Meyer, Karl-Heinrich, to Bayer Aktiengesellschaft. Process for the purification of 2,2-bis-(4-hydroxy-3,5-dichlorophenyl)-propane. 3,957,886, Cl. 260-619.00R.

Meyer, Willy; Bohner, Beat; and Dawes, Dag, to Ciba-Geigy Corporation. O,S-dialkyl urido thiophosphates. 3,957,924, Cl. 260-938.000.

Michael, William H.: *See—*
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Midway Mfg. Co.: *See—*
Maximoff, Paul A., 3,957,338.

Miki, Yukio: *See—*
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Mikulicz, Michael Z.; Boney, William G.; and Vora, Bipin V., to Universal Oil Products Company. Absorption of hydrogen fluoride in alkylated hydrocarbon product. 3,957,902, Cl. 260-683.480.

Miles Laboratories, Inc.: *See—*
Adams, Ernest Clarence; and Teeter, Howard Raymond, 3,957,435.

Milewski, Eckhard: *See—*
Uhl, Klaus; Schmadel, Hermann; Schneider, Gerhart; and Milewski, Eckhard, 3,957,670.

Militana, Salvatore G.: *See—*
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Miller, Alfred F., Jr.: *See—*
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Miller, Clark Ober, to Lubrizol Corporation, The. Ester-containing compositions. 3,957,854, Cl. 260-482.00R.

Miller, Clark Ober, to Lubrizol Corporation, The. Ester-containing compositions. 3,957,855, Cl. 260-482.00R.

Miller, Denver W. Wind driven power mechanism. 3,957,390, Cl. 415-5.000.

Miller, Donald G.: *See—*
Milligan, Barton; and Miller, Donald G., 3,957,889.

Miller, George A.; and Lewis, Sheldon N., to Rohm and Haas Company. 3-Alkoxyisothiazoles. 3,957,808, Cl. 260-302.00A.

Miller, Homer W., to Honeywell Information Systems, Inc. Current mode binary/BCD arithmetic array. 3,958,112, Cl. 235-174.000.

Miller, Michael Clayden; and Hawkins, James Mitchell. Restraint system. 3,957,231, Cl. 244-122.0AG.

Milligan, Barton; and Miller, Donald G., to Air Products and Chemicals, Inc. Selective nitration of aromatic and substituted aromatic compositions. 3,957,889, Cl. 260-645.000.

Milliser, Charles E.; and Sitter, David N., to General Electric Company. Logical solution for mechanical clutch start/stop wear. 3,957,148, Cl. 197-1.00R.

Mills, Walter D., to Shell Oil Company. Device for vaporizing liquid fuel. 3,957,024, Cl. 123-122.00E.

Milton, John L. Musical attachment for guitar. 3,956,963, Cl. 84-296.000.

Mimino, Tohru; Kinoshita, Kazuhisa; Shinoda, Takayuki; Oki, Syuji; and Nagao, Akira, to Nippon Kokan Kabushiki Kaisha. Austenitic heat resisting steel containing chromium and nickel. 3,957,545, Cl. 148-38.000.

Minagawa, Kenichiro: *See—*
Tanizaki, Yoshiharu; Kawaguchi, Hiroshi; and Minagawa, Kenichiro, 3,957,667.

Minami, Noriaki: *See—*
Oka, Akira; Minami, Noriaki; Kondou, Sigehiro; Nakatsuka, Hirosi; Egasira, Hirosi; Hirayama, Mamoru; Hayasi, Yasunori; and Otsukawa, Kazunobu, 3,958,103.

Minch, Morris L., to Motorola, Inc. Low harmonic crystal oscillator. 3,958,190, Cl. 331-116.00R.

Mine Safety Appliances Company: *See—*
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Staub, Charles H., Jr., 3,957,948.

Miner Enterprises, Inc.: *See—*
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Mineral Research & Development Corporation: *See—*
Drinkard, William F., Jr.; and Brown, Henry S., 3,957,601.

Minks, Werner, to International Standard Electric Corporation. Magneto system including a tiltable U-shaped armature. 3,958,198, Cl. 335-128.000.

Minner, Willy: *See—*
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Minnesota Mining and Manufacturing Company: *See—*
Brekken, Roger A.; Evans, Edgar L.; and Olson, George F., 3,958,064.
Schurb, Frank A.; and Evans, Jack L., 3,957,724.

Minolta Camera Kabushiki Kaisha: *See—*
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Miquel, Jean: *See—*
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Misevich, Kenneth W.; and Tucker, Henry G., to Remington Arms Company, Inc. Loading device for a tubular projectile. 3,956,844, Cl. 42-90.000.

Mitchell, Edward: *See—*
Mayer, Edward A.; Alperstein, Martin; Brandenburg, John T.; and Mitchell, Edward, 3,957,446.

Mitchell, Willard N.; Wilson, Edward L.; and Von Rosenberg, Hermann E., to Exxon Research and Engineering Company. Coal gasification ash removal system. 3,957,459, Cl. 48-197.00R.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Iida, Takahiko; Ishido, Michiharu; and Hagihara, Masao, 3,958,137.

Mitsubishi Rayon Co., Ltd.: *See—*
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Mitsuboshi-Sangyo Co., Ltd.: *See—*
Takase, Takashi; Hayashi, Tsunekazu; and Saitoh, Hirokazu, 3,958,067.

Mitsugi, Koji: *See—*
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Mitsui Petrochemical Industries, Ltd.: *See—*
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Mitsui Toatsu Chemicals, Incorporated: *See—*
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Miwa, Naoto: *See—*
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Miyada, Thomas Sanfran. Coaxial rotary engine. 3,956,888, Cl. 60-39.080.

Miyajima, Ryuichi: *See—*
Tobe, Sadanobu; Miyajima, Ryuichi; and Mitsugi, Koji, 3,957,581.

Miyakoshi, Toshinobu: *See—*
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Miyamoto, Haruo; Igami, Ikuo; Uehara, Masaru; Fujita, Hideo; Itoh, Hirotaka; and Kan, Zyozi, to Dainichi-Nippon Cables, Ltd.; and Mitsubishi Rayon Co., Ltd. Process for producing insulating paper where the paper is frictionally calendered. 3,957,573, Cl. 162-102.000.

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Moore, Robert R. Rotator for prosthetic ankle joint. 3,956,775, Cl. 3-33.000.
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Nitto Denki Kigyo Kabushiki Kaisha (Nitto Electric Industrial Co., Ltd.): *See—*
Yabuki, Toshihiro; Yamane, Nobuyuki; Tanigawa, Takumi; Nakagawa, Shigenori; and Tanichi, Toshimasa, 3,958,039.
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Cabestany, Jean; and Schaffer, Erich, 3,957,739.
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Norris, William P., to United States of America, Navy. Preparation of a ferrocenyl compound. 3,957,840, Cl. 260-439.0CY.
North American Philips Corporation: *See—*
Delfino, Michelangelo, 3,957,604.
Noseworthy, Melvin M., to Pfizer Inc. Doxycycline parenteral compositions. 3,957,980, Cl. 424-227.000.
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November, Milton H., to International Telephone and Telegraph Corporation. Densitometer probe shield and well. 3,956,922, Cl. 73-32.00A.
Novitsky, Boris Georgievich: *See—*
Petrushkin, Viktor Dmitrievich; Tarambula, Vladimir Fedorovich; Nesterovich, Anatoly Antonovich; Novitsky, Boris Georgievich; Fridman, Viktor Mironovich; and Shkoropad, Dmitry Evseevich, 3,957,650.
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Ishiwata, Mamoru; Yoshida, Katzutaka; and Nozawa, Hiroshi, 3,956,790.
Nozik, Arthur Jack; and Haacke, Gottfried, to American Cyanamid Company. Greenhouse window for solar heat absorbing systems derived from Cd_2SnO_4. 3,957,029, Cl. 126-270.000.
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Bustard, Thomas Stratton; and Goslee, David Earl, 3,957,541.
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Buyssens, Noel; Davidts, Jan; and Nottebaere, Arseen, 3,957,091.
Nycoil Company: *See—*
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Nyltite Corporation of America: *See—*
Gould, William; and Gould, Charna, 3,957,295.
Nystrom, Per Henrik, to Forenade Fabriksverken. Fuel-air regulating system for hot gas engines. 3,956,892, Cl. 60-524.000.
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Ceausescu, Ion; Constantinescu, Petre; Oachis, Emil; and Cristea, Nicolae, 3,956,852.
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Ronzio, Richard A.; Ziegler, Robert C.; Oberg, Fred N.; and Rickard, R. Stanley, 3,957,946.
Oberley, William J., to Koppers Company, Inc. Chromated copper arsenate wood preservative compositions. 3,957,494, Cl. 106-15.00R.
Obermann, Horst: *See—*
Reinsch, Herbert; Korner, Peter; and Obermann, Horst, 3,957,355.
Oberressl, Paul: *See—*
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Vola, Mathias J. J. M., 3,957,370.
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Ogren, John R.: *See—*
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Ohi, Reiichi; Adachi, Keiichi; Katoh, Norihiko; Kameoka, Kimitaka; Sugiyama, Mitsunori; and Aono, Toshiaki, to Fuji Photo Film Co., Ltd. Silver halide photographic material containing an organic compound having a covalent nitrogen-halogen bond as sensitizer. 3,957,491, Cl. 96-107.000.
Ohno, Shigeru; Hoshi, Noboru; and Sekigawa, Fujio, to Shinetsu Chemical Company. Coating compositions for solid medicines. 3,957,523, Cl. 106-189.000.
Ohorodnik, Alexander; Gehrmann, Klaus; Legutke, Gunter; and Vierling, Hermann, to Hoechst Aktiengesellschaft. Production of monovinylacetylene. 3,957,899, Cl. 260-678.000.
Oka, Akira; Minami, Noriaki; Kondou, Sigehiro; Nakatsuka, Hirosi; Egasira, Hirosi; Hirayama, Mamoru; Hayasi, Yasunori; and Otsukawa, Kazunobu, to Omron Tateisi Electronics Co. Automatic ticket vending system. 3,958,103, Cl. 235-61.80R.
Okabe, Katsuhiko, to Copal Company Limited. Electronic printer. 3,958,254, Cl. 346-139.00C.
Oki, Syuji: *See—*
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Oldham, Robert R.; and Wooddell, John H., to Robert R. Oldham, Inc. Pivotable fluid diverter for recirculation system. 3,957,642, Cl. 210-121.000.
Oleniacz, Walter S., to Lever Brothers Company. Moisturizing units and moisturizing compositions containing the same. 3,957,971, Cl. 424-70.000.
Olin Corporation: *See—*
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O'Link, Maurice H., to Stearns Manufacturing Company. Life preserver vest. 3,956,786, Cl. 9-345.000.
Olinkraft, Inc.: *See—*
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Opyrchal, Martin A., to Duff-Norton Company, Inc. Continuous roller brake. 3,957,144, Cl. 192-8.00R.
Orensten, Henry E.; and Orensten, Vivian C. Filtration means and method. 3,957,634, Cl. 210-11.000.
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Orkin, Bernard A., to Mobil Oil Corporation. Method for reducing the sulfur level of gasoline product. 3,957,625, Cl. 208-211.000.
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Osaki, Tatsuo: *See—*
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Ostapko, Daniel L.: *See—*
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Ostermaier, John Joseph; and Elliott, Curtis Homer, Jr., to W. R. Grace & Co. Process for preparing an attrition resistant zeolite hydrocarbon conversion catalyst. 3,957,689, Cl. 252-455.00Z.
Otis Engineering Corporation: *See—*
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Oka, Akira; Minami, Noriaki; Kondou, Sigehiro; Nakatsuka, Hirosi; Egasira, Hirosi; Hirayama, Mamoru; Hayasi, Yasunori; and Otsukawa, Kazunobu, 3,958,103.
Ott, Karl; and Maydl, Paul, to Etablissement Thermocrete Baupatente Verwertungsgesellschaft. Process for the production of aggregates for concrete by utilization of the residues from the combustion of predominantly organic material. 3,957,528, Cl. 106-309.000.
Otto, Friedrich; Tilch, Heinrich; Kollner, Friedrich; and Rogalski, Manfred, to A. Stephan u. Sohne. Apparatus for comminuting and mixing of foodstuffs. 3,957,215, Cl. 241-282.100.
Oude Alink, Bernardus A., to Petrolite Corporation. Thiophosphates. 3,957,925, Cl. 260-947.000.
Oudet, Claude, to Societe de Recherches en Matiere de Micromoteurs Electriques. Electric motor with bridge-type magnetic circuits. 3,958,139, Cl. 310-49.00R.
Overkott, Franz Josef, to Peddinghaus, Carl Ullrich. Shock-absorber piston. 3,957,140, Cl. 188-317.000.
Overwien, Hermann: *See—*
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Owens-Corning Fiberglas Corporation: *See—*
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Packard Instrument Company, Inc.: *See—*
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Pai, Panemangalore S.; Petersen, Harro; and Klippel, Friedrich, to BASF Aktiengesellschaft. Process for easy-care finishing cellulosics. 3,957,431, Cl. 8-182.000.
Palamara, Joseph P., to Display Originals, Inc. Storage and dispenser unit for boxes. 3,957,174, Cl. 221-111.000.
Palitsyn, Nikanor Petrovich: *See—*
Nesmeyanov, Alexandr Nikolaevich; Bogomolova, Ljubov Grigorievna; Kochetkova, Nadezhda Sergeevna; Vilchevskaya, Vera Dmitrievna; Palitsyn, Nikanor Petrovich; Gorelikova, Julia Julievna; Andrianova, Irina Gennadievna; Belozerova, Olga Petrovna; and Sjundjukova, Vera Khusainovna, 3,957,841.
Palm, John W.; and Berry, Kay L., to Amoco Production Company. Method for recovering sulfur from ammonia-containing acid gas streams. 3,957,960, Cl. 423-573.00G.
Palosi, Eva: *See—*
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szeberenyi, Szaboles; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 3,957,777.
Palovaara, Jaakko, to Valmet Oy. Devices for braking sheet-material reelers. 3,957,221, Cl. 242-99.000.
Panish, Morton B.; and Rozgonyi, George Arthur, to Bell Telephone Laboratories, Incorporated. Stress reduction in AlGaAs-AlGaAsP multilayer structures. 3,958,263, Cl. 357-18.000.
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Pankova, Klavdia Vasilievna: *See—*
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Papsdorf, John W., to Cardinal of Adrian, Inc. Punched tape control system. 3,957,189, Cl. 226-9.000.
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Parrish's Cake Decorating Supplies, Inc.: *See—*
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Pass. Raymond Vincent; and Crowley, Daniel Joseph, to AMP Incorporated. Printed circuit board array for card reader. 3,957,334, Cl. 339-75.0MP.
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Pautrat, Rene; and Marteau, Jacques, to Anvar, Agence Nationale de Valorisation de la Recherche. Method for the preparation of rubbers with low molecular weights through degradation of macromolecular polyenes, and the products thus obtained. 3,957,737, Cl. 260-79.30R.
Payne, Betty Lou B. P., executrix: *See—*
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Payne, Bobby L., to Rodco, Inc. Method of inspecting and treating sucker rod. 3,958,049, Cl. 427-327.000.
Payne, Linwood K., Jr., deceased (by Payne, Betty Lou B. P., executrix), to Union Carbide Corporation. Carbamate pesticidal compositions. 3,958,006, Cl. 424-300.000.
Pearson, Robert P., to Honeywell Inc. Strain gauge transducer apparatus. 3,956,927, Cl. 73-88.5SD.
Pech, Bernard Marcel, to Societe Nationale des Poudres et Explosifs. Tensioning device capable of damped return movement and retensioning. 3,957,281, Cl. 280-744.000.
Pecksen, Otto, to IndustrieWerke Karlsruhe-Augsburg Aktiengesellschaft. Position-independent mine construction. 3,956,988, Cl. 102-19.200.
Peddinghaus, Carl Ullrich. Apparatus for cylinders to be filled with pressurised gas. 3,957,259, Cl. 267-64.00R.
Peddinghaus, Carl Ullrich: *See—*
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Peet, Robert L., to Bliss & Laughlin Ind., Inc. Process of making lids for microelectronic circuit gases. 3,956,814, Cl. 29-414.000.
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Perkins, Dwight L. Safety ignition switch and brake actuator. 3,957,131, Cl. 180-99.000.
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Peterson, Carl R., to Rapidex, Inc. In situ values extraction. 3,957,305, Cl. 299-2.000.
Peterson, M. Maurice. Pressure responsive engine ignition control system. 3,957,023, Cl. 123-117.00R.
Peterson, Richard H. Phase-lock multiple tone generator system. 3,956,961, Cl. 84-1.240.
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Yale, Harry Louis; and Petigara, Ramesh B., 3,957,799.
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Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,957,833.
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Phelps, David Reeves; and Ryan, Paul Thomas, to General Electric Company. Method and apparatus for transitioning diverse power sources to rail vehicles. 3,957,236, Cl. 246-187.00B.
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Piccinini, Carlo; Morelli, Morello; and Rebora, Pierluigi, to Snam Progetti, S.p.A. Process for the production of ethylene oxide. 3,957,834, Cl. 260-348.50R.

Pieper, Josef; and Pieper nee Piseberg, Ursula, to Bremshey Aktiengesellschaft. Umbrella. 3,957,070, Cl. 135-33.00R.
Pieper nee Piseberg, Ursula: *See—*
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Pinnow, Kenneth E.; and Bressanelli, Jerome P., to Crucible Inc. Ferritic stainless steels. 3,957,544, Cl. 148-34.000.
Pintschovius, Ulrich; Schinzel, Erich; and Rosch, Gunter, to Hoechst Aktiengesellschaft. Monostyryl-naphthalene derivatives. 3,957,846, Cl. 260-465.00D.
Pircon, Ladislav J. Pollution control apparatus and method. 3,957,465, Cl. 55-90.000.
Pirooz, Perry P.; Schmid, Anthony P.; and Sturgill, Dennis T., to Owens-Illinois, Inc. Electric power transmission line. 3,958,074, Cl. 174-15.00C.
Pitchford, Alan G.: *See—*
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Pitts, Frank, to Magnesium Elektron Limited. Stabilised zirconia and a process for the preparation thereof. 3,957,500, Cl. 106-57.000.
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Linton, Robert W., 3,957,520.
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Plasser, Franz; Theurer, Josef; and Folser, Karl, to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H. Ballast treating method. 3,957,000, Cl. 171-16.000.
Pledger, Richard Payne, to United States of America, Air Force. System for simulating missile target motion using steering mirrors. 3,957,356, Cl. 350-301.000.
Plegere, Daina Arvidovna: *See—*
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Ploger, Walter; and Worms, Karl-Heinz, to Henkel & Cie G.m.b.H. Process for the prevention of precipitations in water or aqueous solutions. 3,957,160, Cl. 210-58.000.
Plust, Heinz G.: *See—*
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Pocobello, Michael A., to American Safety Equipment Corporation. One-way spring loaded connector for single retractor continuous loop restraint system. 3,957,283, Cl. 280-747.000.
Podesva, Ctirad; and Hughes, Lise A., to Delmar Chemicals Limited. Novel phthalazinone compounds. 3,957,776, Cl. 260-247.20A.
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Radlmann, Eduard; Schramm, Jurgen; and Nischk, Gunther, to Bayer Aktiengesellschaft. Polyamide concentrates containing sulphonate groups. 3,957,734, Cl. 260-78.00L.
Radulescu, Tudor. Fumigant container. 3,956,849, Cl. 43-127.000.
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Salto, Rinaldo, to Ing. C. Olivetti & C., S.p.A. Selector system for a type-bearing element of an office machine. 3,957,149, Cl. 197-16.000.

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Schubert, John C.; and Le Duc, Edward C., to Standard Oil Company. Wrinkle free extrusion coating of heat fusible foam sheet. 3,957,940, Cl. 264-171.000.

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Seki, Mitsuru; and Hosoda, Toru, to Nissan Motor Co., Ltd. Mechanism producing a linear reciprocating output motion with a low speed interval near the center of the stroke. 3,956,942, Cl. 74-52.000.

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Shavel, John, Jr.: *See—*
Fabian, Arthur C.; Genzer, Jerome D.; Kasulanis, Charles Francis; Shavel, John, Jr.; and Zinnes, Harold, 3,957,772.

Shavyrin, Vladimir Sergeevich; Gusakov, Vyacheslav Nikolaevich; Pankova, Klavdia Vasilievna; Polyakova, Nina Petrovna; Shirkaeva, Natalya Petrovna; Gorin, Valentin Nicolaevich; Golovin, Oleg Semenovich; Mastjukov, Alexei Egorovich, deceased; and Mastjukova, Maria Pavlovna, heir. Lubricant composition for drilling pipe. 3,957,663, Cl. 252-43.000.

Shaw, Hugh E., Jr.: *See—*
Cherenko, Joseph P.; and Shaw, Hugh E., Jr., 3,958,245.

Shaw, Robert Alfred, to Birkbeck College. Electrochemical production of substituted pyridines. 3,957,606, Cl. 204-165.000.

Shea, Michael M.: *See—*
Katz, Seymour; and Shea, Michael M., 3,957,958.

Shelby, William Barney. Re-breathing apparatus. 3,957,043, Cl. 128-142.00G.

Shell Oil Company: *See—*
Baumgartner, Herman J., 3,957,914.
Closmann, Philip J., 3,957,306.
Knibbe, David E.; and Pitham, David C. S., 3,957,112.
Mills, Walter D., 3,957,024.
Naber, Jaap E.; and Ramsbotham, John, 3,957,952.
Prescott, B. Osborn; Rittenhouse, Gordon, deceased; Walters, Arley; and Wise, Harold L., 3,957,439.
Ramsbotham, John, 3,957,962.
van de Kraats, Eduard J.; and Buitelaar, Arnold A., 3,957,659.
Verschuur, Eke, 3,957,456.

Shelton, Joseph T.: *See—*
Edling, Porter R.; Jefferies, Robert K.; and Shelton, Joseph T., 3,957,291.

Shepard, John W.; Jezl, James L.; Peters, Edwin F.; and Hall, Robert D., to Standard Oil Company. Divided horizontal reactor for the vapor phase polymerization of monomers at different hydrogen levels. 3,957,448, Cl. 23-288.00R.

Shepley, Martin Alan: *See—*
Massey, John; Shepley, Martin Alan; Suiter, Roger N.; and Murphy, John M., 3,957,428.

Sheppard, Chester Stephen: *See—*
MacLeay, Ronald Edward; and Sheppard, Chester Stephen, 3,957,750.

Sheratte, Martin B., to McDonnell Douglas Corporation. Novel epoxy compounds and functional fluid compositions containing such compounds. 3,957,668, Cl. 252-78.000.

Sherwood Medical Industries Inc.: *See—*
Reeves, Richard A.; and LaHay, James F., 3,958,177.

Sheth, Prabhakar Ranchhordas: *See—*
Sangekar, Surendra Anandrao; and Sheth, Prabhakar Ranchhordas, 3,957,662.

Shiba, Kikuo, to Hitachi Shipbuilding and Engineering Co., Ltd. Apparatus for rotating bottles. 3,957,154, Cl. 198-209.000.

Shibata, Fujio: *See—*
Umeki, Shinji; and Shibata, Fujio, 3,958,068.

Shibata, Norio: *See—*
Goto, Kenji; and Shibata, Norio, 3,957,444.

Shigekawa, Toy T., to United States of America, Air Force. Method and device for evaluating penetrants. 3,958,119, Cl. 250-302.000.

Shigeno, Shunichi, to Yoshida Kogyo Kabushiki Kaisha. Slider holder for the assemblage of slide fasteners. 3,956,813, Cl. 29-207.5SL.

Shima, Takeo: *See—*
Yokoyama, Seiichi; Urasaki, Takanori; Tokashiki, Michiyuki; and Shima, Takeo, 3,957,896.

Shimano Industrial Company, Limited: *See—*
Kine, Masayoshi, 3,957,138.

Shimizu, Masanao: *See—*
Nishimura, Haruki; Uno, Hitoshi; Natsuka, Kagayaki; Shimokawa, Noriaki; Shimizu, Masanao; and Nakamura, Hideo, 3,957,788.

Shimokawa, Noriaki: *See—*
Nishimura, Haruki; Uno, Hitoshi; Natsuka, Kagayaki; Shimokawa, Noriaki; Shimizu, Masanao; and Nakamura, Hideo, 3,957,788.

Shimomura, Naonobu. Barometric altimeter with digital linearization. 3,958,108, Cl. 235-150.250.

Shin-Etsu Chemical Co., Ltd.: *See—*
Harada, Naohiko; and Tanaka, Masaki, 3,957,717.

Shin Nihon Kagaku Kogyo Kabushiki Kaisha: *See—*
Sano, Hiroshi; Matsuno, Nozomu; and Okina, Katsumi, 3,957,674.

Shine, Dennis F.; and Torau, Gunther W., to Baxter Laboratories, Inc. Sealed thermoplastic bottle. 3,957,168, Cl. 215-1.00C.

Shinetsu Chemical Company: *See—*
Ohno, Shigeru; Hoshi, Noboru; and Sekigawa, Fujio, 3,957,523.

Shinoda, Takayuki: *See—*
Mimino, Tohru; Kinoshita, Kazuhisa; Shinoda, Takayuki; Oki, Syuji; and Nagao, Akira, 3,957,545.

Shinomiya, Hiroshi; Muro, Kakuro; Fukuda, Akimitsu; Nagae, Yoshio; and Shirogane, Yoshiji, to Oxy Metal Industries Corporation. Method for rinsing a conversion coated metal surface. 3,957,543, Cl. 148-6.15R.

Shintani, Tutomu: *See—*
Isaoka, Shin-ichi; Shintani, Tutomu; Suzuki, Mamoru; and Tohma, Wataru, 3,957,904.

Shirai, Masaharu: *See—*
Sumoto, Misao; Imanaka, Hiroshi; and Shirai, Masaharu, 3,957,905.

Shirkaeva, Natalya Petrovna: *See—*
Shavyrin, Vladimir Sergeevich; Gusakov, Vyacheslav Nikolaevich; Pankova, Klavdia Vasilievna; Polyakova, Nina Petrovna; Shirkaeva, Natalya Petrovna; Gorin, Valentin Nicolaevich; Golovin, Oleg Semenovich; Mastjukov, Alexei Egorovich, deceased; and Mastjukova, Maria Pavlovna, heir, 3,957,663.

Shirogane, Yoshiji: *See—*
Shinomiya, Hiroshi; Muro, Kakuro; Fukuda, Akimitsu; Nagae, Yoshio; and Shirogane, Yoshiji, 3,957,543.

Shiseido Co., Ltd.: *See—*
Fujiyama, Yoshio; Kanda, Yoshihiro; and Matsuda, Hajime, 3,957,969.

Shkoropad, Dmitry Evseevich: *See—*
Petrushkin, Viktor Dmitrievich; Tarambula, Vladimir Fedorovich; Nesterovich, Anatoly Antonovich; Novitsky, Boris Georgievich; Fridman, Viktor Mironovich; and Shkoropad, Dmitry Evseevich, 3,957,650.

Shoberg, Ralph S., to GSE, Inc. Driveline torque and/or thrust sensor. 3,956,930, Cl. 73-133.00R.

Short Brothers & Harland Limited: *See—*
Hutchinson, Terence, 3,957,377.

Short, Robert J., to Justin Enterprises, Inc. Method of transporting and constructing tanks. 3,956,816, Cl. 29-429.000.

Showa Denko Kabushiki Kaisha: *See—*
Ishioka, Ryoji; Kametaka, Norio; and Marumo, Kuniomi, 3,957,804.

Shults, Leon; and Zinn, Carlton C. Cleaning tool for cleaning closely spaced electrical contact surfaces and the like. 3,956,789, Cl. 15-88.000.

Shurman, Daniel A. Back pack with resilient bands for spacing the pack from the wearer. 3,957,184, Cl. 224-8.00R.

Shuster, Edward J.: *See—*
Wilson, Richard Arnold; Katz, Ira; Vock, Manfred H.; and Shuster, Edward J., 3,958,030.

Sibley, Scott F. Attitude meter with rotatable arcuate scale. 3,956,831, Cl. 33-352.000.

Siczek, Bernard, to Graco Inc. Diaphragm pump. 3,957,399, Cl. 417-387.000.

Sidlauskas, David P., to Schlage Electronics, Inc. Electronic recognition and identification system for identifying several master keys. 3,958,105, Cl. 235-61.11H.

Sidor, Edward F., to Illinois Tool Works Inc. Positional transducer utilizing magnetic elements having improved operating characteristics. 3,958,202, Cl. 336-110.000.

Siegwart, Hans-Rudolf: *See—*
Brandestini, Antonio; Siegwart, Hans-Rudolf; and Welbergen, Gerard, 3,956,797.

Siemens Aktiengesellschaft: *See—*
Dittrich, Werner; and Rauch, Werner, 3,956,983.
Hassler, Heinrich; and Lippmann, Hans-Joachim, 3,957,453.
Hieber, Konrad; and Politycki, Alfred, 3,958,071.
Kleeberg, Wolfgang; Rubner, Roland; and Bartel, Wieland, 3,957,512.
Lang, Karl, 3,957,274.
Maas, Michael, 3,958,134.
Neeb, Karl Heinz; and Neidl, Herbert, 3,957,693.
Rueckmann, Bernd, 3,958,253.

Sigmund, Wilhelm: *See—*
Deuschel, Walter; Gulbins, Erich; Hauss, Alfred; Lausberg, Dietrich; and Sigmund, Wilhelm, 3,957,744.

Silberman, Ira J., to Diversified Products Corporation. Method and apparatus for assembly of table tennis table. 3,957,268, Cl. 273-30.000.

Sill, Arthur D.: *See—*
Carr, Albert A.; Fleming, Robert W.; and Sill, Arthur D., 3,957,986.
Fleming, Robert W.; and Sill, Arthur D., 3,957,988.
Fleming, Robert W.; Sill, Arthur D.; and Sweet, Francis W., 3,957,989.

Silver, Alexander, to Garrett Corporation, The. Shaped foil bearing. 3,957,317, Cl. 308-9.000.

Silverman, Robert A.; and Wright, Charles J., to Eastman Kodak Company. 2-Haloethylsulfonyl photographic hardener compounds, compositions, articles and preparation processes. 3,957,882, Cl. 260-607.00A.

Silvernail, James M.: *See—*
Schoen, Donald W.; and Silvernail, James M., 3,957,639.

Simmonds, Milo R.: *See—*
United States of America, National Aeronautics and Space Administration; Sullivan, John L.; Giorgini, Eugene A.; and Simmonds, Milo R., 3,957,044.

Simon-Rosedowns Limited: *See—*
Alexander, David George; Forster, Allen; and Farmery, David William, 3,958,027.

Simon, Wilhelm; and Pretsch, Erno, to W. Moller Glasblaserei. Process for the preparation of lipide soluble complexes of cations, application of the process and use of the complexes. 3,957,607, Cl. 204-180.00P.

Simonov, Andrei Mikhailovich: *See—*
Tsibizov, Jury Nikolaevich; Pozharsky, Fedor Tikhonovich; Simonov, Andrei Mikhailovich; Knyazhansky, Mikhail Isaakovich; and Strjukov, Mikhail Borisovich, 3,957,810.

Simons, Charles W.: *See—*
DiBiasio, Vincent I.; Simons, Charles W.; and O'Neill, Gerald J., 3,958,013.

Simpson, William R., to Sandoz, Inc. Hydroxyalkyl-piperazinoquinoline nitrates. 3,957,791, Cl. 260-268.0BQ.

Sims, Rex J.; and Stahl, Howard D., to General Foods Corporation. Shelf stable emulsions. 3,958,033, Cl. 426-602.000.

Sims, Rex Junior; and Fioriti, Joseph Anthony, to General Foods Corporation. Methional-antioxidant for polyunsaturated oils. 3,957,837, Cl. 260-398.500.

Singer Company, The: *See—*
Della Torre, Giancarlo, 3,957,002.
Ketterer, Stanley Joseph; and Ivanko, Francis, 3,957,004.

Singer, Heinrich; and Csajagi, Sandor, to Ciba-Geigy Corporation. Composition for making textiles flame-proof and its application. 3,958,061, Cl. 428-276.000.

Singleton, Andrew D.: *See—*
Stearns, Charles K.; and Singleton, Andrew D., 3,958,035.

Sircar, Shivaji: *See—*
Drissel, Gerald M.; and Sircar, Shivaji, 3,957,463.

Sirven, Jacques, to Thomson-CSF. System for measuring the velocity of a moving object. 3,958,242, Cl. 343-8.000.

Siskin, Michael; and Porcelli, Joseph J., to Exxon Research and Engineering Company. Removal of organic sulfur compounds from hydrocarbon feedstocks. 3,957,628, Cl. 208-223.000.

Sitter, David N.: *See—*
Milliser, Charles E.; and Sitter, David N., 3,957,148.

Sivigny, Arthur Lawrence: *See—*
Mulvey, William Joseph; Adams, David Orin; and Sivigny, Arthur Lawrence, 3,957,234.

Sjundjukova, Vera Khusainovna: *See—*
Nesmeyanov, Alexandr Nikolaevich; Bogomolova, Ljubov Grigorievna; Kochetkova, Nadezhda Sergeevna; Vilchevskaya, Vera Dmitrievna; Palitsyn, Nikanor Petrovich; Gorelikova, Julia Julievna; Andrianova, Irina Gennadievna; Belozerova, Olga Petrovna; and Sjundjukova, Vera Khusainovna, 3,957,841.

SKF Industrial Trading and Development Company, B.V.: *See—*
Ullberg, Carl, 3,957,385.

Skillman, Jack J. Pour spout. 3,957,180, Cl. 222-528.000.

Skoultchi, Martin M., to National Starch and Chemical Corporation. Anaerobic adhesive and sealant compositions employing a two component catalyst system of diazosulfone and o-sulfobenzimide. 3,957,561, Cl. 156-331.000.

Slaats, Mathew A.; and Slayton, J. Richard, to Kimball International, Inc. Joint construction such as for furniture and method of making. 3,957,239, Cl. 248-188.000.

Slathar, Donald A.; and Neutkens, Christiaan H., to International Telephone and Telegraph Corporation. Cartoning apparatus with undercount memory means. 3,956,869, Cl. 53-53.000.

Slayton, J. Richard: *See—*
Slaats, Mathew A.; and Slayton, J. Richard, 3,957,239.

Sloan, Albert H. Dewatering pump assembly having a heat exchanger. 3,957,402, Cl. 417-367.000.

Sloan, Albert H. Dewatering pump assembly. 3,957,403, Cl. 417-390.000.

Sloan, Hilbert: *See—*
Homick, Richard P.; and Sloan, Hilbert, 3,957,505.

Sloan, Kenneth B.: *See—*
Bodor, Nicolae S.; and Sloan, Kenneth B., 3,957,803.

Slovenska vedecko-technicka spolocnost Dom techniky: *See—*
Lenorak, Ferdinand, 3,956,875.

Smart, Thomas John: *See—*
Moore, Edwin Barclay; and Smart, Thomas John, 3,958,076.

Smiltniex, Etil Kharaldovich: *See—*
Bramberga, Velta Mikelevna; Grendze, Teodor Arvidovich; Plegere, Daina Arvidovna; Khesin, Arkady Yakovlevich; and Smiltniex, Etil Kharaldovich, 3,957,034.

Smith, Edmund H., Jr.: *See—*
Faulhaber, Mark E.; and Smith, Edmund H., Jr., 3,958,127.

Smith, Gijsbertus Marinus: *See—*
Dikhoff, Johannes Aloysius Maria; and Smith, Gijsbertus Marinus, 3,957,678.

Smith, Harold Vernon, to Pennwalt Corporation. Non-chromated alkaline etching bath and etching process for aluminum. 3,957,553, Cl. 156-22.000.

Smith, James D. B.: *See—*
Phillips, David C.; and Smith, James D. B., 3,957,014.

Smith, John Lynn: *See—*
Ehrsam, William Friedrich; Meyer, Carl H. W.; Powers, Robert Lowell; Prentice, Paul Norman; Smith, John Lynn; and Tuchman, Walter Leonard, 3,958,081.

Smith, John W., Jr.: *See—*
Brugh, Latane D., Jr.; and Smith, John W., Jr., 3,958,056.

Smith, Normand C.: *See—*
DeMaine, Frank J.; Pelkie, Robert E.; Smith, Normand C.; and Tomek, Reinhold E., 3,958,249.

Smith, Pete Hugh. Reel-in spooled fishline dispenser. 3,957,224, Cl. 242-129.600.

Smith, Richard Terence, to Rubery Owen Mechanical Equipment. Straddle carriers. 3,957,165, Cl. 214-394.000.

Smith, Robert A.; and Surprenant, Richard P., to General Electric Company. Cross-linking agents for room temperature vulcanizable silicone rubber compositions. 3,957,704, Cl. 260-18.00S.

Smith, Samuel C. Hardness tester. 3,956,925, Cl. 73-81.000.

Smith, Thomas M., to Monarch Marking Systems, Inc. Composite label web and method of making same. 3,958,051, Cl. 428-42.000.

Smith, Trevor Stanley, to Joseph Lucas (Industries) Limited. Fuel control system for gas turbine engine. 3,956,889, Cl. 60-39.28R.

Smith & Wesson Chemical Company, Inc.: *See—*
Litman, Alan, 3,956,843.

Smith, Willis D.: *See—*
Goettel, Robert J.; Goettel, Richard J.; and Smith, Willis D., 3,956,952.

SmithKline Corporation: *See—*
Berges, David Alan, 3,957,768.
De Marinis, Robert M., 3,957,770.
DeMarinis, Robert M., 3,957,984.
Frazee, James S.; and Jen, Timothy Yu-Wen, 3,957,985.

Snam Progetti S.p.A.: *See—*
Bianco, Ettore, 3,958,215.
Girotti, Pierleone; Tesei, Renato; and Floris, Telemaco, 3,957,898.
Piccinini, Carlo; Morelli, Morello; and Rebora, Pierluigi, 3,957,834.

Societa' Farmaceutici Italia S.p.A.: *See—*
Arcari, Giuliana; Bernardi, Luigi; Bosisio, Germano; Foglio, Maurizio; Glasser, Alfredo; and Temperilli, Aldemio, 3,957,785.

Societe Anonyme dite: S.I.E.T.A.M.: *See—*
Charpentier, Jean G., 3,957,254.

Societe de Recherches en Matiere de Micromoteurs Electriques: *See—*
Oudet, Claude, 3,958,139.

Societe d'Etude et d'Eploitation de Marques Mar-Pha: *See—*
Mardiguian, Jean, 3,957,879.

Societe d'Etudes et d'Exploitation de Marques et Brevets S.E.M.S.: *See—*
Bohuon, Odile, 3,957,853.

Societe Francaise des produits pour Catalyse: *See—*
Duhaut, Pierre; Martino, Germain; and Miquel, Jean, 3,957,686.

Societe Nationale des Poudres et Explosifs: *See—*
Pech, Bernard Marcel, 3,957,281.

Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See—*
Sauthier, Pierre, 3,958,182.

Soda, Kazuya; and Miwa, Naoto, to Nippondenso Co., Ltd. High temperature thermistor. 3,958,209, Cl. 338-22.00R.

Soderqvist, Anton L. O., to LKB-Produkter AB. Method and device for displacement of a workpiece. 3,957,162, Cl. 214-1.00R.

Solomon, David Henry; and McLean, Colin Douglas, to ICI Australia Limited. Process for polymerizing allylamines employing a redox initiator consisting of Fe or Ti with H_2O_2, hydroxyl amine, or hydroperoxides to form insoluble crosslinked polymers. 3,957,699, Cl. 260-2.10E.

Solomon, David Henry: *See—*
Hodgkin, Jonathan Howard; Hawthorne, David Geoffrey; Swift, Jean Drummond; and Solomon, David Henry, 3,957,526.

Sony Corporation: *See—*
Sumiyoshi, Koichiro, 3,958,271.
Yasuda, Shiro, 3,957,272.

Soulant, Herman A., Jr. Stabilization system for water vehicles, platforms, and structures in wind-maintained seas. 3,957,010, Cl. 114-123.000.

Sowinski, Francis A.; and Vogt, B. Richard, to E. R. Squibb & Sons, Inc. 1,2,4-Benzothiadiazines. 3,957,769, Cl. 260-243.00D.

Spaldero Design, Inc.: *See—*
Spaulding, Ken, 3,956,774.

Spanswick, James, to Standard Oil Company. Translucent impact polystyrene. 3,957,915, Cl. 260-880.00R.

Spaulding, Ken, to Spaldero Design, Inc. Item of apparel. 3,956,774, Cl. 2-79.000.

Specht, Dieter, to Interroll Fordertechnik GmbH & Co. KG. Roller for conveyor apparatus. 3,957,147, Cl. 193-37.000.

Spector, Richard; and Stretanski, Joseph Anthony, to American Cyanamid Company. N-(2,2,6,6-tetramethyl-4-piperidyl) substituted amidothio phosphates. 3,957,798, Cl. 260-293.730.

Speers, Jerry M.: *See—*
Barry, Adelbert; Robinson, Leon H.; and Speers, Jerry M., 3,957,118.

Sperry-New Holland: *See—*
Komancheck, John J., 3,957,058.

Sperry Rand Corporation: *See—*
Klenik, Ralph L., Jr.; and Dyar, Ralph E., 3,957,324.

Sperry Rand Limited: *See—*
Cooper, John Edwin, 3,957,396.

Spinnler, Ralph F., to Teleco Inc. Pilot operated mud-pulse valve. 3,958,217, Cl. 340-18.0LD.

Spirig, Ernst. Water decomposition apparatus for producing detonating gas. 3,957,618, Cl. 204-270.000.

Spivey, Allen. Spray gun. 3,957,208, Cl. 239-372.000.

Sprangle, Phillip A.; and Granatstein, Victor L., to United States of America, Navy. Stimulated coherent cyclotron scattering, millimeter, and submillimeter wave generator. 3,958,189, Cl. 331-94.5PE.

Square D Company: *See—*
Davies, Terrence Ardern; and Swallow, Peter John, 3,957,508.

Squires, Arthur M. Gasifying coal or coke and discharging ash agglomerates. 3,957,457, Cl. 48-73.000.

Squires, Arthur M. Gasifying coal or coke and discharging slag frit. 3,957,458, Cl. 48-73.000.

Squires, Arthur M. Treating gas with catalytic dust in panel bed. 3,957,953, Cl. 423-244.000.

Staal, Gerardus B.: *See—*
Henrick, Clive A.; and Staal, Gerardus B., 3,957,849.

Stach, Kurt: *See—*
Berger, Herbert; Gall, Rudi; Merdes, Hartmut; Stach, Kurt; Sauer, Winfriede; and Vomel, Wolfgang, 3,957,766.

Stack, Gary F., to General Motors Corporation. Liquid filter. 3,957,640, Cl. 210-117.000.

Stahl, Howard D.: *See—*
Sims, Rex J.; and Stahl, Howard D., 3,958,033.

Staley Elevator Company, Inc.: *See—*
Mozdzer, Alexander, 3,958,131.

Stamicarbon B.V.: *See—*
van den Berg, Cornelis E.P.V., 3,957,910.
Verstegen, Johannes D. M.; and Kaasenbrood, Petrus J. C., 3,957,868.

Stamicarbon N.V.: *See—*
Roest, Bernard C.; and Schepers, Herman A. J., 3,957,913.

Standard Oil Company: *See—*
Schubert, John C.; and Le Duc, Edward C., 3,957,940.
Shepard, John W.; Jezl, James L.; Peters, Edwin F.; and Hall, Robert D., 3,957,448.
Spanswick, James, 3,957,915.

Standard Oil Company (Ohio), The: *See—*
Herrington, Daniel R.; and Schwerko, Albert P., 3,957,627.

Stark, Thomas M.; and Bodnick, Sheldon. Mixed refrigerant cycle. 3,957,473, Cl. 62-9.000.

Staub, Charles H., Jr., to Mine Safety Appliances Company. Method of controlling oxygen generation and CO_2 removal in a closed chamber. 3,957,948, Cl. 423-230.000.

Staude, Eberhard, to Hoechst Aktiengesellschaft. Process for the production of a dry desalting cellulose acetate membrane. 3,957,935, Cl. 264-41.000.

Stauffer Chemical Company: *See—*
Gutman, Arnold D., 3,957,926.

Stauffer, Norman L., to Honeywell Inc. Distance determining and automatic focusing apparatus. 3,958,117, Cl. 250-201.000.

Stauner, Thomas; Kitzing, Rainer; Hagen, Remon; and Boragine, Carlo, to Ciba-Geigy AG. Process for crosslinking hydrophilic colloids. 3,958,050, Cl. 427-333.000.

Ste. D'Application Plastique, Mecanique et Electronique Plastimecanique: *See—*
Lechevallier, Raymond, 3,957,412.

Stearns, Charles K.; and Singleton, Andrew D., to Kraftco Corporation. Method of manufacturing omelet type egg product. 3,958,035, Cl. 426-614.000.

Stearns Manufacturing Company: *See—*
O'Link, Maurice H., 3,956,786.

Steffens, Jack E.: *See—*
Albano, Rocco V.; Fraleigh, Robert J.; and Steffens, Jack E., 3,958,133.

Steigerwald, Thomas E.: *See—*
Klein, Gerald I.; and Steigerwald, Thomas E., 3,958,194.

Steiman, Wolf, to VCA Corporation. Hand-held dispenser pump construction. 3,957,178, Cl. 222-321.000.

Stendel, Wilhelm: *See—*
Hoffmann, Hellmut; Hammann, Ingeborg; Behrenz, Wolfgang; and Stendel, Wilhelm, 3,957,977.

Stengel, Edgar, to AEG-Elotherm G.m.b.H. Hardening apparatus with a hardening tank, especially in hardening machines for crankshafts. 3,957,257, Cl. 266-133.000.

Stenger, Antoine; Cousse, Henri; and Mouzin, Gilbert, to Pierre Fabre S.A. Medicaments having psychotropic properties (antitussives). 3,958,002, Cl. 424-274.000.

Stephens, James B.: *See—*
United States of America, National Aeronautics and Space Administration; Stephens, James B.; and Laue, Eric G., 3,956,932.

Sterling Drug Inc.: *See—*
Knopp, Paul V.; and Gitchel, Wayne B., 3,957,632.
Wentland, Mark P.; and Albertson, Noel F., 3,957,793.

Stevens, Don L.: *See—*
Filter, Harold E.; and Stevens, Don L., 3,957,551.

Stevenson, John Leslie: *See—*
Dyott, Richard Burnaby; and Stevenson, John Leslie, 3,957,343.

Stevenson, John Stuart: *See—*
Tulsi, Surindar Singh; and Stevenson, John Stuart, 3,957,669.

Stockman, Helmut; Schutte, Klaus; and Hurtmanns, Heinz. Gyratory crusher with material distribution means. 3,957,213, Cl. 241-202.000.

Stockwell, Glade M., to Rockwell International Corporation. Backlighted display apparatus. 3,957,351, Cl. 350-160.0LC.

Stoepel, Kurt: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,957,998.

Stoller, Frederick L., to Phillips Petroleum Company. Mattress. 3,956,783, Cl. 5-345.00R.

Stone Container Corporation: *See—*
Vickers, James Lee; and Waycie, Edmund A., 3,956,874.

Stone, Thomas W., to Ventrola Manufacturing Company. Means for preventing heat build-up in a wall-mounted room ventilator. 3,958,100, Cl. 219-361.000.

Stoner, Joel A. Liquid supply device with automatic flow cut-off. 3,957,093, Cl. 141-209.000.

Stork-Brabant B.V.: *See—*
Verbakel, Godefriedus Hendrikus Waltherus, 3,956,794.

Storz-Endoskop GmbH: *See—*
Storz, Karl, 3,957,252.

Storz, Karl, to Storz-Endoskop GmbH. Apparatus for cleaning medical instruments. 3,957,252, Cl. 259-1.00R.

Stout, Albert W., deceased: *See—*
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Stout, Zelda M., executor: *See—*
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Tantillo, James M.; and Ramsay, Donald C., to Component Manufacturing Service, Inc. Swivel connector for electrical appliances. 3,957,331, Cl. 339-6.00R.
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Topham, Silas Charles, to Medical Development Corporation. Pumping-syringe. 3,957,052, Cl. 128-278.000.
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Henrick, Clive A.; and Staal, Gerardus B., 3,957,849.
Willy, William E.; and Henrick, Clive A., 3,958,010.
Zondler, Helmut, to Ciba-Geigy Corporation. Pyrrolidines containing two primary amino groups and process for their manufacture. 3,957,820, Cl. 260-326.850.
Zuckerman, Leonard, to Servo Corporation of America. Multiplexed optical scanner system. 3,958,104, Cl. 235-61.11E.
Zurbuchen, Jacques: *See—*
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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Akzona Incorporated: *See*—
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Beer, Henri Bernard, to Chemnor Corporation. Method of making an electrode having a coating containing a platinum metal oxide thereon. Re. 28,820, Cl. 427-126.000.

Chemnor Corporation: *See*—
Beer, Henri Bernard, Re. 28,820.

Coleman, Charles H., Jr., to Ampex Corporation. Switching sequence detector for PAL color television. Re. 28,823, Cl. 358-18.000.

Davies, Robert William; Veness, Maxwell Francis; and Thornton, Leonard, to Molins Limited. Packing machine. Re. 28,813, Cl. 53-53.000.

Duffy, Richard J., to USM Corporation. Method of making self-locking threaded elements. Re. 28,812, Cl. 10-10.00P.

Eymans, Jacobus Johannes Antonius; Holman, Egbert Willem; and Jaspers, Hans, to Akzona Incorporated. Stabilized dibenzoyl peroxides polymer initiator compositions. Re. 28,818, Cl. 252-186.000.

Fritts, Rex E., to Amana Refrigeration, Inc. Safety interlock system for microwave ovens. Re. 28,822, Cl. 317-40.00R.

GKN Sankey Limited: *See*—
Humphrey, Victor William Stanley, Re. 28,817.

Holman, Egbert Willem: *See*—
Eymans, Jacobus Johannes Antonius; Holman, Egbert Willem; and Jaspers, Hans, Re. 28,818.

Humphrey, Victor William Stanley, to GKN Sankey Limited; and Aro Plastics Development Limited. Apparatus for moulding plastic articles. Re. 28,817, Cl. 249-91.000.

Jaspers, Hans: *See*—
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Kato, Ryuzo, to Matsushita Electronics Corporation. Pick-up tube envelope sealant extending into groove of annular target support. Re. 28,821, Cl. 313-390.000.

Kearney & Trecker Corporation: *See*—
Lohneis, Earl R.; and Stobbe, Richard E., Re. 28,814.

Lambrecht, Ralph E.; and Najimian, Harry, Jr., to Outboard Marine Corporation. Stern drive unit propeller trimming arrangement. Re. 28,816, Cl. 115-41.00R.

Lohneis, Earl R.; and Stobbe, Richard E., to Kearney & Trecker Corporation. Index and table drive means for a machine tool. Re. 28,814, Cl. 90-58.00B.

Matsushita Electronics Corporation: *See*—
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Molins Limited: *See*—
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Outboard Marine Corporation: *See*—
Lambrecht, Ralph E.; and Najimian, Harry, Jr., Re. 28,816.

Schmiterlow, Fredrick, to Allmanna Svenska Elektriska Aktiebolaget. Spring supported railway vehicle. Re. 28,815, Cl. 105-199.00R.

Stobbe, Richard E.: *See*—
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Thompson, Geoffrey F., Re. 28,819.

Thompson, Geoffrey F., to Syntex (U.S.A.) Inc. Dialkylated glycol compositions and medicament preparations containing same. Re. 28,819, Cl. 424-243.000.

Thornton, Leonard: *See*—
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Fantom, John W., to Fantom & Gahs Greenhouses, Inc. Poinsettia plant. 3,889, 5–18–76, Cl. 86.

Hines, James W., Jr., to Hines Wholesale Nurseries. Pyracantha plant. 3,887, 5–18–76, Cl. 54.

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Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,890, 5–18–76, Cl. 76.

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Baker, John B. Safety flag. 239,926, 5–18–76, Cl. D10—109.

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Bohlmann, Orville R. Picnic table. 239,904, 5–18–76, Cl. D6—45.

Boldt, Melvin H., and D. P. Chuboc, to Zenith Radio Corp. Combined phonograph and tuner. 239,970, 5–18–76, Cl. D56—4.

Bottcher, Dallas R. Combined art tool caddy and removable handle therefor. 239,896, 5–18–76, Cl. D6—189.

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Breeden, John E., to Hopeman Brothers, Inc. Insulator support for utility poles. 239,912, 5–18–76, Cl. D8—234.

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Finch, Lorraine. Pocket attachable to a strap or similar article. 239,886, 5–18–76, Cl. D2—400.
Floren, Carl H., to The Gillette Co. Packaging container for a razor or the like. 239,920, 5–18–76, Cl. D9—186.
Fortune, William S. Holder for soldering instrument or the like. 239,916, 5–18–76, Cl. D8—71.
Frost, Charles W. Cigarette holder. 239,947, 5–18–76, Cl. D27—7.
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Kaye, Leonard, to Capehart Corp. Clock radio. 239,971, 5–18–76, Cl. D56—4.
Kermes, Constantine J., and E. W. Rowland-Hill, to Sperry-Rand Corp. Cab for a harvesting machine. 239,965, 5–18–76, Cl. D40—1.
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Long, Stapleton, to The Berkline Corp. Chair. 239,900, 5–18–76, Cl. D6—71.
Lundberg, Kurt B. K. A. Collapsible filing cabinet. 239,895, 5–18–76, Cl. D6—167.
Lynd, Lawrence C., to Ohio Container Co. Bottle. 239,923, 5–18–76, Cl. D9—28.
Malcolm, Frederick H. Music stand. 239,899, 5–18–76, Cl. D6—18.
Manderfield, Ellen B., to Oneida Ltd. Spoon or similar article. 239,908, 5–18–76, Cl. D7—137.
Martin, David A. Air circulating device. 239,940, 5–18–76, Cl. D23—160.
Matthew, Morton P. Instrument for guiding the drawing of designs. 239,925, 5–18–76, Cl. D10—61.
Matthews, Charles G. Arc welding electrode holder. 239,915. 5–18–76, Cl. D8—71.
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Miyasaki, Sadayasu. Bank. 239,960, 5–18–76. Cl. D34—11.
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399 3,956,863
414 3,956,864

CLASS 53
22A 3,956,867
29 3,956,865
3,956,866
48 3,956,868
53 Re.28,813
3,956,869
55 3,956,870
67 3,956,871
131 3,956,872
198R 3,956,873
207 3,956,874

CLASS 55
2 3,957,462
25 3,957,463
68 3,957,464
90 3,957,465
256 3,957,466
3,957,467
259 3,957,468
270 3,957,469
342 3,957,470
396 3,957,471

CLASS 57
58.61 3,956,875
58.95 3,956,876
145 3,956,877
157TS 3,956,878

CLASS 58
2 3,956,879
23B 3,956,880
115 3,956,881

CLASS 60
39.08 3,956,888
39.12 3,956,882
39.14 3,956,883
39.2 3,956,887
39.28R 3,956,884
3,956,889
39.46M 3,956,885
39.69 3,956,886
219 3,956,890
413 3,956,891
464 3,956,893
508 3,956,894
516 3,956,895
524 3,956,892
545 3,956,896
660 3,956,897
676 3,956,898
682 3,956,899

CLASS 61
36R 3,956,900
72.1 3,956,901

CLASS 62
3 3,956,902
4 3,957,472
9 3,957,473
54 3,956,903
402 3,956,904

CLASS 64
30E 3,956,905

CLASS 65
3A 3,957,474
29 3,957,475
30R 3,957,476
158 3,957,477
181 3,957,478
350 3,957,479

CLASS 66
42 3,956,906
149R 3,956,907
175 3,956,908
177 3,956,909

CLASS 68
176 3,956,910

CLASS 70
100 3,956,911
360 3,956,912
456R 3,956,913

CLASS 71
92 3,957,480
93 3,957,481

CLASS 72
80 3,956,914
198 3,956,915
217 3,956,916
337 3,956,917
402 3,956,918

CLASS 73
1B 3,956,919
32A 3,956,922
49.3 3,956,923
81 3,956,924
3,956,925
88E 3,956,926
88.5SD 3,956,927
116 3,956,928
133R 3,956,929
3,956,930
146 3,956,931
189 3,956,932
209 3,956,933
323 3,956,934
347 3,956,935
359 3,956,936
395 3,956,937
398AR 3,956,920
398R 3,956,938
419 3,956,939
421.5R 3,956,921
3,956,940

CLASS 74
1.5I6 3,956,948
52 3,956,942
243R 3,956,943
244 3,956,944
710.5 3,956,945
759 3,956,946
866 3,956,947

CLASS 75
.5BA 3,957,482
.5R 3,957,483
9 3,957,484
21 3,957,485
34 3,957,486
49 3,957,487
58 3,957,502
77 3,957,503
101BE 3,957,504
108 3,957,505
3,957,506
134N 3,957,507
206 3,957,508

CLASS 76
89.1 3,956,948

CLASS 81
135 3,956,949
426 3,956,950

CLASS 83
14 3,956,951
145 3,956,952
188 3,956,953
285 3,956,954
310 3,956,955
345 3,956,956
482 3,956,957

CLASS 84
1.01 3,956,958
1.15 3,956,959
1.19 3,956,960
1.24 3,956,961
267 3,956,962
296 3,956,963

CLASS 89
1.5D 3,956,964
41ME 3,956,966
41A 3,956,965
175 3,956,967

CLASS 90
13.05 3,956,968
58B Re.28,814

CLASS 91
6.5 3,956,969
173 3,956,970
384 3,956,971
485 3,956,972

CLASS 92
5R 3,956,973

CLASS 93
36A 3,956,974
49M 3,956,975
53SD 3,956,976

CLASS 96
1PE 3,957,510
1E 3,957,511
1R 3,957,509
35.1 3,957,512
48HD 3,957,515
48QP 3,957,513
48R 3,957,514
53 3,957,516
61R 3,957,517
64 3,957,488
3,957,518
91R 3,957,489
94R 3,957,490
107 3,957,491
114 3,957,492
114.1 3,957,493

CLASS 98
115LH 3,956,977

CLASS 99
329R 3,956,978
421V 3,956,979

CLASS 100
38 3,956,980
39 3,956,981
212 3,956,982

CLASS 101
6 3,956,983
124 3,956,984
142 3,956,985
350 3,956,986
425 3,956,987

CLASS 102
19.2 3,956,988
67 3,956,989
69 3,956,990
70.2P 3,956,991
73A 3,956,992
81 3,956,993

CLASS 104
88 3,956,994
138G 3,956,995

CLASS 105
199R Re.28,815
308B 3,956,996

CLASS 106
15R 3,957,494
19 3,957,495
39.8 3,957,496
48 3,957,497
52 3,957,498
54 3,957,499
57 3,957,500
75 3,957,501
85 3,957,519
3,957,520
100 3,957,521
109 3,957,522
189 3,957,523
277 3,957,524
288B 3,957,525
300 3,957,526
306 3,957,527
309 3,957,528

CLASS 109
20 3,956,997

CLASS 110
1A 3,956,998
173B 3,957,001

CLASS 111
7 3,956,999

CLASS 112
158R 3,957,003
169 3,957,004
258 3,957,002

CLASS 113
1F 3,957,005

CLASS 114
.5R 3,957,006
16A 3,957,007
67A 3,957,008
74R 3,957,009
123 3,957,010

CLASS 115
41R Re.28,816
3,957,011

CLASS 116
6 3,957,012
81 3,957,013
114F 3,957,014

CLASS 118
100 3,957,015
637 3,957,016

CLASS 119
3 3,957,017
14.08 3,957,018

CLASS 121
32 3,957,019

CLASS 123
8.05 3,957,020
8.11 3,957,021
97B 3,957,022
117R 3,957,023
122E 3,957,024
136 3,957,025
179G 3,957,026

CLASS 124
23R 3,957,027

CLASS 125
12 3,957,028

CLASS 126
270 3,957,029
3,957,030
3,957,031
271.2R 3,957,032

CLASS 128
1.1 3,957,033
2R 3,957,034
2T 3,957,035
2.1E 3,957,037
2.1R 3,957,036
24R 3,957,038
58 3,957,039
75 3,957,040
94 3,957,041
130 3,957,042
142G 3,957,043
142.2 3,957,044
142.3 3,957,045
145.5 3,957,046
145.8 3,957,047
214R 3,957,048
260 3,957,049
275 3,957,050
278 3,957,051
3,957,052
303.18 3,957,053
350R 3,957,054
351 3,957,055
419R 3,957,056
478 3,957,057

CLASS 130
27J 3,957,058

CLASS 131
10R 3,957,059
17R 3,957,060
3,957,061
84B 3,957,062
140P 3,957,063
171A 3,957,064

CLASS 132
7 3,957,065
88.7 3,957,066
89 3,957,067

CLASS 134
3 3,957,529
4 3,957,530
11 3,957,531

CLASS 135
15CF 3,957,068
15PE 3,957,069
33R 3,957,070
47 3,957,071

CLASS 136
75 3,957,532
83R 3,957,533
86D 3,957,534
86E 3,957,535
86R 3,957,536
89 3,957,537
133 3,957,538
170 3,957,539
173 3,957,540

205 3,957,541
CLASS 137
38 3,957,072
87 3,957,073
102 3,957,074
117 3,957,075
344 3,957,076
383 3,957,077
525.1 3,957,078
596.18 3,957,079
599 3,957,080
625.4 3,957,081
625.41 3,957,082
CLASS 138
43 3,957,083
122 3,957,084
129 3,957,085
145 3,957,086
178 3,957,087
CLASS 139
117 3,957,088
409 3,957,090
425R 3,957,091
448 3,957,089
CLASS 140
115 3,957,092
CLASS 141
209 3,957,093
CLASS 144
230 3,957,094
CLASS 145
5R 3,957,095
50R 3,957,096
CLASS 148
6.15R 3,957,543
12.3 3,957,542
34 3,957,544
38 3,957,545
111 3,957,546
186 3,957,547
CLASS 149
10 3,957,548
19.5 3,957,551
19.91 3,957,549
35 3,957,550
CLASS 150
.5 3,957,097
9 3,957,098
28R 3,957,099
CLASS 152
9 3,957,100
301 3,957,101
CLASS 156
11 3,957,552
22 3,957,553
62.6 3,957,554
72 3,957,555
87 3,957,556
211 3,957,557
212 3,957,558
254 3,957,559
293 3,957,560
331 3,957,561
384 3,957,562
438 3,957,563
497 3,957,564
500 3,957,565
3,957,566
505 3,957,567
510 3,957,568
515 3,957,569
519 3,957,570
CLASS 160
206 3,957,102
CLASS 162
3 3,957,571
4 3,957,572
102 3,957,573
167 3,957,574
CLASS 164
16 3,957,103
132 3,957,104
274 3,957,105
CLASS 165
9 3,957,106
32 3,957,107
45 3,957,108
48 3,957,109
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96 3,957,111
CLASS 166
.5 3,957,112
77.5 3,957,113
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264 3,957,117
285 3,957,114
297 3,957,115
315 3,957,118
3,957,119
CLASS 168
4 3,957,120
CLASS 171
16 3,957,000
CLASS 172
4.5 3,957,121
60 3,957,122
481 3,957,123
CLASS 173
28 3,957,124
150 3,957,125
CLASS 174
15C 3,958,074
16HS 3,958,075
42 3,958,076
CLASS 176
18 3,957,575
19LD 3,957,576
36R 3,957,577
CLASS 177
122 3,957,126
CLASS 178
6 3,958,077
6.8 3,958,078
3,958,079
7.91 3,958,080
22 3,958,081
26R 3,958,088
58A 3,958,082
69.5R 3,958,083
CLASS 179
1CN 3,958,084
1GQ 3,958,085
15BY 3,958,086
CLASS 180
64R 3,957,127
3,957,128
99 3,957,131
152 3,957,129
159 3,957,130
CLASS 181
57 3,957,132
60 3,957,133
176 3,957,134
CLASS 182
136 3,957,135
CLASS 185
39 3,957,136
CLASS 187
11 3,957,137
CLASS 188
196F 3,957,138
244 3,957,139
317 3,957,140
CLASS 190
42 3,957,141
CLASS 191
23A 3,957,142
CLASS 192
4A 3,957,143
8R 3,957,144
13R 3,957,145
111A 3,957,146
CLASS 193
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CLASS 195
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30 3,957,579
59 3,957,580
65 3,957,581
66B 3,957,582
66R 3,957,587
103.5R 3,957,583
3,957,584
109 3,957,585
127 3,957,586
CLASS 197
1R 3,957,148
16 3,957,149
17 3,957,150
49 3,957,151
CLASS 198
34 3,957,152
168 3,957,153
209 3,957,154
230 3,957,155
235 3,957,156
CLASS 200
17R 3,958,087
48KB 3,958,089
67AA 3,958,090
67D 3,958,091
81.9M 3,958,092
144B 3,958,093
283 3,958,094
293 3,958,095
CLASS 202
172 3,957,588
185B 3,957,589
258 3,957,590
263 3,957,591
CLASS 204
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37T 3,957,594
55R 3,957,595
59F 3,957,596
60 3,957,597
72 3,957,598
105R 3,957,599
3,957,600
3,957,601
106 3,957,602
111 3,957,603
130 3,957,604
159.14 3,957,605
165 3,957,606
180P 3,957,607
192 3,957,608
3,957,609
195B 3,957,611
195M 3,957,612
3,957,613
195R 3,957,610
224R 3,957,614
260 3,957,615
270 3,957,618
281 3,957,616
305 3,957,617
CLASS 206
.83 3,957,157
320 3,957,158
390 3,956,782
CLASS 208
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46 3,957,620
60 3,957,621
89 3,957,622
120 3,957,623
139 3,957,624
211 3,957,625
213 3,957,626
216 3,957,627
223 3,957,628
CLASS 209
136 3,957,629
3,957,630
421 3,957,631
CLASS 210
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11 3,957,634
24 3,957,635
58 3,957,160
67 3,957,636
73R 3,957,637
104 3,957,633
3,957,638
107 3,957,639
117 3,957,640
120 3,957,641
121 3,957,642
149 3,957,643
169 3,957,644
231 3,957,645
242S 3,957,646
265 3,957,647
321R 3,957,648
376 3,957,649
380R 3,957,650
490 3,957,651
498 3,957,652
516 3,957,654
518 3,957,653
519 3,957,655
521 3,957,656
CLASS 211
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CLASS 212
69 3,957,161
CLASS 214
1R 3,957,162
6.5 3,957,163
75H 3,957,164
394 3,957,165
505 3,957,166
766 3,957,167
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1C 3,957,168
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CLASS 219
75 3,958,096
76 3,958,097
126 3,958,098
270 3,958,099
361 3,958,100
365 3,958,101
CLASS 220
9LG 3,957,170
71 3,957,171
269 3,957,172
CLASS 221
15 3,957,173
111 3,957,174
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318 3,957,177
321 3,957,178
528 3,957,179
3,957,180
534 3,957,181
CLASS 223
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CLASS 224
5W 3,957,183
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CLASS 225
3 3,957,186
CLASS 226
7 3,957,187
9 3,957,188
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CLASS 227
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123 3,957,192
CLASS 228
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14C 3,957,196
CLASS 233
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61NV 3,957,199
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3,958,106
61.11H 3,958,105
61.6R 3,958,102
61.8R 3,958,103
150.21 3,958,107
150.25 3,958,108
151 3,958,109
153AC 3,958,110
153AK 3,958,111
174 3,958,112
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44R 3,957,200
CLASS 238
298 3,957,201
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128 3,957,203
177 3,957,204
230 3,957,205
265.33 3,957,206
265.35 3,957,207
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1LP 3,958,114
1.3 3,958,115
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202 3,957,213
246 3,957,214
282.1 3,957,215
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47.03 3,957,218
55.19A 3,957,219
67.3R 3,957,220
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107 3,957,222
107.6 3,957,223
129.6 3,957,224
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122AG 3,957,231
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137R 3,957,233
3,957,234
152 3,957,235
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187B 3,957,236
CLASS 248
1 3,957,237
68R 3,957,238
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214 3,957,240
288 3,957,241
318 3,957,242
370 3,957,243
CLASS 249
91 Re.28,817
CLASS 250
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221 3,958,118
302 3,958,119
321 3,958,120
330 3,958,121
346 3,958,122
413 3,958,123
442 3,958,124
480 3,958,125
554 3,958,126
563 3,958,127
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577 3,958,129
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CLASS 252
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3,957,658
8.3 3,957,659
8.5C 3,957,660
8.9 3,957,661
11 3,957,662
43 3,957,663
59 3,957,664
63.2 3,957,665
73 3,957,666
3,957,667
78 3,957,668
79.4 3,957,669
102 3,957,670
142 3,957,671
171 3,957,672
178 3,957,673
182 3,957,674
186 Re.28,818
300 3,957,675
301.1W 3,957,676
301.17 3,957,677
301.6S 3,957,678
351 3,957,679
353 3,957,680
373 3,957,681
3,957,682
428 3,957,683
3,957,684
432 3,957,685
441 3,957,686
455R 3,957,687
3,957,688
455Z 3,957,689
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465 3,957,691
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514 3,957,694
518 3,957,696
532 3,957,695
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89 3,957,254
185 3,957,255
193 3,957,256
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2.1E 3,957,699
2.1R 3,957,698
2.5AR 3,957,702
2.5F 3,957,700
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17.5 3,957,703
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22R 3,957,705
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29.4UA 3,957,708
29.4R 3,957,709
29.6RW 3,957,711
29.6TA 3,957,710
31.4R 3,957,712
32.8SB 3,957,713
33.6SB 3,957,714
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37SB 3,957,715
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45.7R 3,957,720
45.75W 3,957,722
3,957,723
45.8N 3,957,721
46.5E 3,957,724
46.5R 3,957,725
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47EA 3,957,727
47XA 3,957,728
70A 3,957,731
78TF 3,957,735
78L 3,957,734
78R 3,957,733
79.3R 3,957,737
79.5C 3,957,738
125 3,957,745
3,957,746
153 3,957,747
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154 3,957,748
156 3,957,749
174 3,957,750
205 3,957,752
210AB 3,957,754
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239D 3,957,757
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239.3R 3,957,756
239.3T 3,957,760
240D 3,957,762
240G 3,957,761
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3,957,765
240R 3,957,763
240.1 3,957,766
240.9 3,957,767
243C 3,957,768
3,957,770
3,957,773
243D 3,957,769
243R 3,957,771
3,957,772
246B 3,957,774
247.1E 3,957,775
247.2A 3,957,776
247.7R 3,957,777
248NS 3,957,778
249.5 3,957,779
3,957,780
250BC 3,957,782
250BN 3,957,781
251A 3,957,783
251R 3,957,891
256.4C 3,957,784
3,957,785
3,957,786
256.4H 3,957,787
268BQ 3,957,791
268BZ 3,957,790
268PH 3,957,788
3,957,789
290R 3,957,792
293.54 3,957,793
293.55 3,957,794
293.65 3,957,795
293.66 3,957,796
3,957,797
293.73 3,957,798
293.88 3,957,800
294.8F 3,957,799
294.8K 3,957,801
3,957,802
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295L 3,957,803
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306.7R 3,957,811
306.8R 3,957,812
307D 3,957,810
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310C 3,957,816
310D 3,957,815
310R 3,957,817
326.15 3,957,819
326.2 3,957,818
326.85 3,957,820
335 3,957,821
340.3 3,957,822
340.5 3,957,823
343.2F 3,957,825
343.2R 3,957,824
343.3R 3,957,826
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346.2M 3,957,829
346.8R 3,957,830
348A 3,957,729
3,957,831
348R 3,957,832
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348.5R 3,957,834
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398.5 3,957,837
410.9R 3,957,838
429.7 3,957,839
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3,957,841
448.2B 3,957,843
448.2E 3,957,844
449 3,957,857
465D 3,957,846
465E 3,957,845
465.4 3,957,847
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471R 3,957,850
473R 3,957,852
480 3,957,853
482R 3,957,854
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502.4P 3,957,858
505P 3,957,859
508 3,957,860
515R 3,957,861
520E 3,957,862
534G 3,957,864
534R 3,957,863
551R 3,957,865
553DA 3,957,866
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555A 3,957,868
561N 3,957,869
562N 3,957,870
562R 3,957,871
571 3,957,872
576 3,957,873
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585B 3,957,875
586G 3,957,878
586P 3,957,876
586R 3,957,877
590FA 3,957,879
594 3,957,730
604HF 3,957,880
606.5P 3,957,881
607A 3,957,882
610B 3,957,883
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	310	239,887	189	239,896		100	239,921		239,935		239,964
	400	239,886	191	239,889		159	239,922	D22—	13	239,936	MM	239,957
D6—	18	239,899	196	239,898		186	239,920		19	239,937	PP	239,949
	24	239,905	D7—	50	239,907		190	239,918	D23—	22	239,941	SS	239,952
	45	239,904		91	239,909		191	239,919		40	239,938	D	239,956
	67	239,890		131	239,906	D10—	61	239,925		151	239,939	G	239,953
	71	239,900		137	239,908		75	239,927		160	239,940	L	239,954
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	151	239,891		68	239,917		109	239,926		D	239,943		239,959
	154	239,893		71	239,915	D12—	73	239,930		5C	239,945		239,960
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Design Patents

5 : 239,937	239,925	22 : 239,928	239,892	239,931	239,975
6 : 239,890	239,930	24 : 239,950	239,893	239,957	239,976
239,905	11 : 239,947	25 : 239,920	239,934	239,967	239,977
239,910	12 : 239,889	239,949	239,935	40 : 239,938	239,978
239,913	13 : 239,912	239,952	239,962	239,966	239,979
239,916	239,921	26 : 239,886	239,971	41 : 239,899	44 : 239,943
239,945	17 : 239,909	239,917	36 : 239,891	239,940	47 : 239,900
239,946	239,911	27 : 239,897	239,908	42 : 239,898	239,915
239,951	239,919	239,953	239,922	239,932	48 : 239,936
239,964	239,942	239,954	239,981	239,944	239,941
239,980	239,968	239,955	39 : 239,901	239,965	239,958
8 : 239,903	239,970	239,956	239,902	239,972	51 : 239,894
239,969	18 : 239,929	31 : 239,896	239,914	239,973	239,927
9 : 239,887	239,933	34 : 239,888	239,923	239,974	53 : 239,926
239,906	19 : 239,904				

Plant Patents

6 : 3,886	3,887	24 : 3,889	39 : 3,888	3,890

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U.S. DEPARTMENT OF COMMERCE
Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE
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